

# THE GEOGRAPHICAL MAGAZINE

VOLUME VIII, NO. 1

ONE SHILLING MONTHLY

NOVEMBER 1938

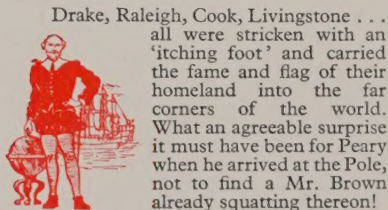






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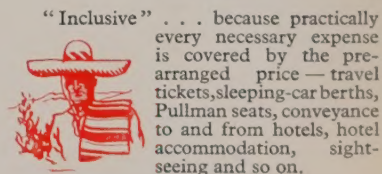
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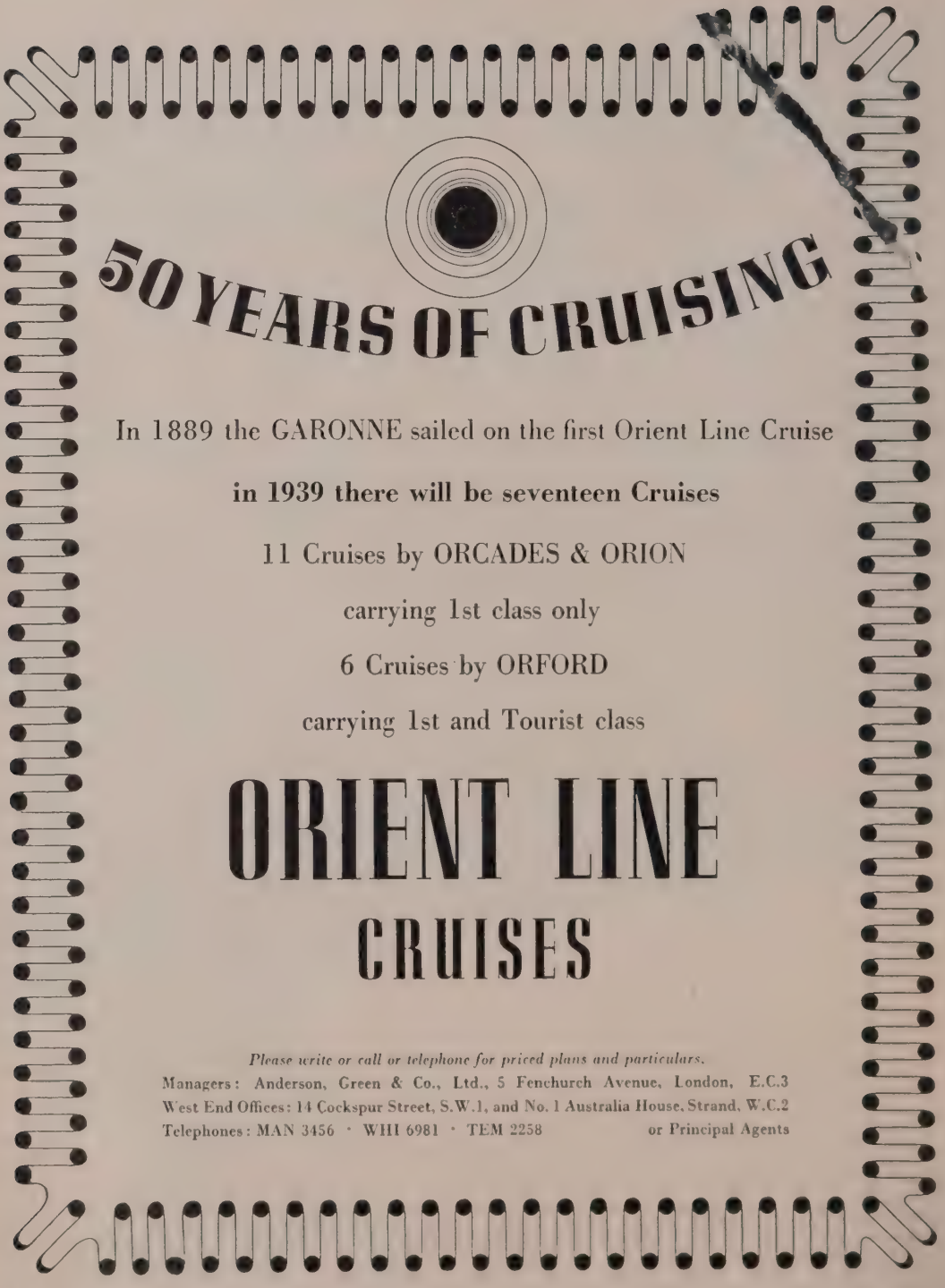
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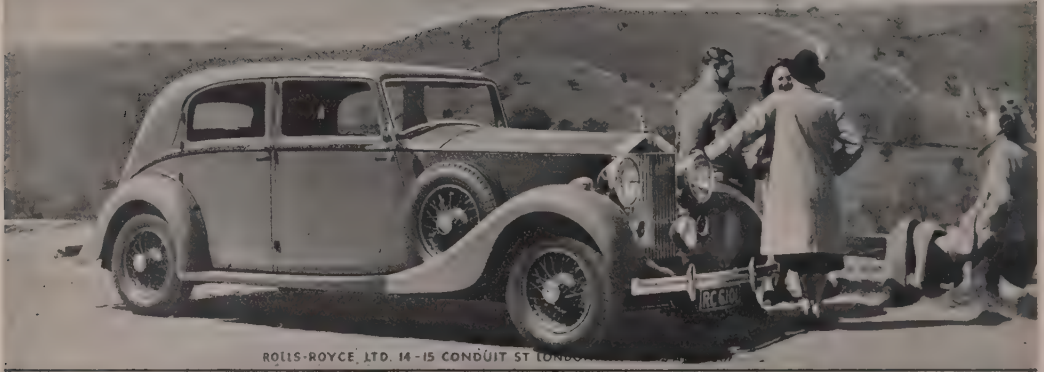
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# Zanzibar

## Gateway to East Africa: Home of the Clove

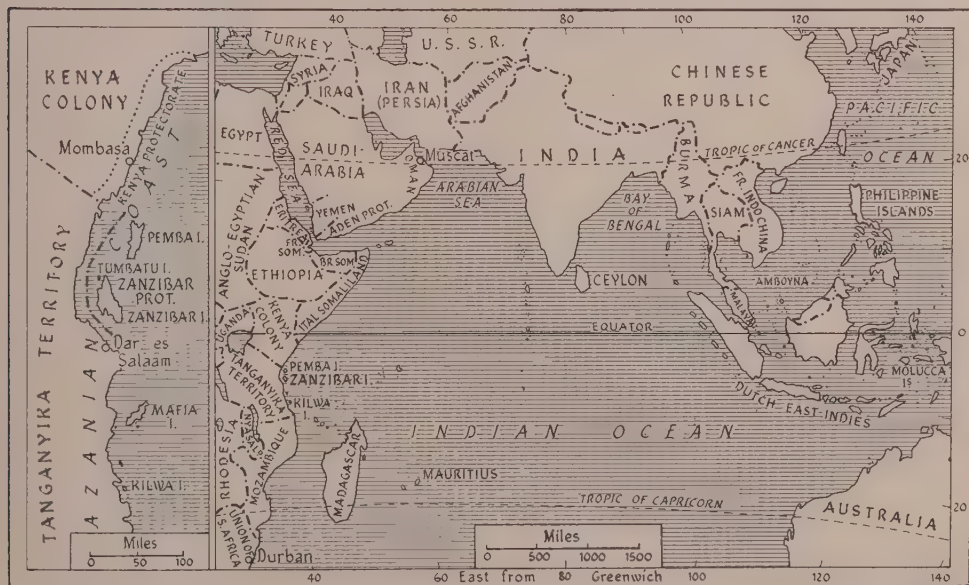
by FERGUS WILSON

*Previous articles in The Geographical Magazine have dealt with the Arab seamen of the Indian Ocean, their part in spreading the Mohammedan religion around its coasts, and the trading and family connections which they have created between places several thousand miles apart. Mr Wilson, of the Zanzibar Department of Agriculture, shows what the island owes to Arab enterprise and how attractive and strangely cosmopolitan a place is this centre of contact between Africa, the Orient and the world at large*

'KASKAZI', the north-east monsoon, blows down the east coast of Africa from November to March. From Arabia and the Persian Gulf comes quite a 'caravan' of stately two-masted dhows bringing the wares of those regions—carpets, dates, salt and dried shark—for sale or exchange with the ivory and other commodities of the east coast of Africa. That this monsoon navigation of the Indian Ocean has existed from time immemorial is no matter of conjecture. The following extract from the *Periplus of the Erythrian Sea*, written about A.D. 60, describes what is now without doubt considered to have been either the island of Zanzibar or Pemba.

... after two courses of a day and a night, along the Ausantic coast, is the island of Menuthias, about three hundred stadia from the mainland, low and wooded, in which there are rivers and many kinds of birds, and the mountain tortoise. There are no wild beasts except the crocodiles; but there they do not attack men. In this place there are sewed boats, and canoes hollowed from single logs, which they use for fishing and catching tortoise. In this island they also catch them in a peculiar way, in wicker baskets, which they fasten across the channel opening between the breakers.

It is evident that Menuthias and the adjacent Azanian coast were not only the



sites of early settlement by immigrants but also carried on a regular trade with the annual visitors brought by the north-east monsoon. The *Periplus* specifically mentions the various products which were obtained from these regions: ivory, tortoiseshell and slaves. For these were exchanged cloth and other wares brought from the more civilized parts of the world.

The rise of Islam in the 7th and 8th centuries further increased trade with and emigration to the East African littoral and islands. With the fall of Egypt to the Arab invaders in A.D. 640 their eyes were turned to the less-known regions of the Azanian coast. Islamic settlements flourished and the immigrants brought with them not only their customs but also their architectural skill. Stone-built towns took the place of primitive settlements in favourable places on the mainland coast or on the islands of the Zanzibar Archipelago. The united power of Islam was, however, rent by schisms during the 9th century and rival sultanates of Persians and Arabs were set up in various places. Internecine strife at home brought waves of emigration and by the end of the 10th century Persian domination was established by the foundation of the Zenj Empire with the island of Kilwa as its capital. Zanzibar also was a centre of important colonization as is borne out by the extensive stone ruins of a city dating back to this period on Tumbatu island which lies one or two miles off the north-west coast of Zanzibar.

European influence in East Africa dates back to the historic voyage of Vasco da Gama in 1498 when, having successfully rounded the Cape, he sailed up the east coast in search of the Spice Islands. This voyage of discovery was the prelude to Portuguese invasion. Urged on by the twofold impetus of trade and the spreading of Christianity, the Portuguese finally overthrew the Zenj Empire in the 16th century and became the dominant power in East Africa. The Persian capital of Zanzibar, Unguja Ukuu, was captured by

the Portuguese in 1503, held until 1652 when it was taken by the Arabs, and finally destroyed by another Portuguese invasion of 1653.

There are two interesting survivals of the Portuguese occupation. One is the Pemba bull-fights which are held to this day. They are more of a game than a fight, for most of the spectators take part and the bull is merely encouraged to run hither and thither after scattering natives to the amusement and delight of their companions. The other survival is that of the wild pig which is very common in many districts. The pig was once domesticated but presumably became wild when the Portuguese finally departed.

The rule of the Portuguese lasted about 150 years, when, after successive defeats, it gave place to the ascendant power of the Omani Arabs. To them belongs the credit not only of the early development of island and coastal trading-centres but also of much of the pioneer penetration into the interior. It was during this period that, owing to the genius of Seyyid Said bin Sultan (Imam of Oman and Sultan of Zanzibar, 1804-1856), Zanzibar became the trade focus of East Africa and the home of the clove industry. Seyyid Said moved from Muscat to East Africa in 1832 and, with considerable foresight, made his headquarters at Zanzibar. It was he who chose the site of Zanzibar city, with its excellent anchorages, for his capital. Up till that time it had consisted only of a few scattered buildings and a walled stronghold which had been used successively as a Portuguese church and an Arab fort.

The word 'trade-focus' calls to mind a most important feature of those days, the slave trade. Zanzibar was the emporium for thousands of African slaves, booty from frequent raids on mainland villages. Dark dungeons which still exist beneath many of the tall Arab houses indicate where slaves were confined before they were sold in the great market of Mkunazini. Today



*Zanzibar owes its modern development to the genius of Seyyid Said, Imam of Oman, who moved thither from Muscat in 1832. But enterprising sailors from Arabia—*

*—in their well-built dhows had for many centuries been making the 2000-mile voyage to the Azanian coast on the wings of the north-east monsoon; to carry back the products of mysterious Africa*



*All photographs by Rogers Wilson*





*Notable among Zanzibar City's modern buildings is the Bet-el-Amani, a museum which was erected after the Great War as a peace memorial. (Left) The entrance to the Sultan's palace, at night*



*The imposing Post Office in the Main Street*



a fine Cathedral stands on the very site of the old slave-market, silent witness to the struggle and final victory of 19th-century public opinion which demanded the abolition of the traffic in human souls.

The economic penetration of East Africa by various European Powers may be said to date from the exploration of Central Africa by such pioneers as David Livingstone, and the opening of the Suez Canal in 1869. In the general formation of colonies and protectorates by European nations in East Africa, Zanzibar was finally recognized as being under British protection in 1890. This Protectorate includes not only the islands of Zanzibar and Pemba but also a 10-mile-wide strip along the coast of Kenya, which pays an annual rental of £11,000. To this day the red flag of the Sultan of Zanzibar is to be seen flying high over the ancient Fort Jesus at Mombasa.

The present Sultan, His Highness Seyyid Khalifa bin Harub, G.C.M.G., G.B.E., acceded in 1911 and in the year 1936 celebrated the Silver Jubilee of a reign which has seen great progress in the general and economic development of the Protectorate. A British Resident (now Mr J. Hathorn Hall, C.M.G., D.S.O.) is responsible to the Colonial Office for the administration of the Protectorate.

#### ORIENTAL AFRICA

It is not surprising that with so chequered a history Zanzibar is the home of a remarkably cosmopolitan people. Numerically the Africans are in the majority, but this category includes not only the indigenous tribes of the more remote districts (the Hadimu, Tumbatu and Pemba) and the numerous descendants of slaves, but also a large number of immigrant labourers from the mainland (principally Nyamwezi) who do much of the work of cultivation on the clove and coconut plantations. The term 'Swahili', so often applied to the African or part-African population of Zanzibar, is a

general one referring to all native tribes in the coastal regions of East Africa.

The large Arab population may be divided into two main sections, the Omani Arabs from the north-east of Arabia (to whom the term 'Manga' is often applied) and the Shihiris and Hadhramis from the Hadhramaut. The former, being the last conquerors of Zanzibar, may be called the aristocracy. They own the majority of the large clove plantations.

The third great section of the community is composed of Indians who have been for many years closely associated with both the external and internal trade of the Islands. One can hardly pass through any small country village without noticing the superior house of the local Indian trader; and in the city the numerous Indian communities are readily distinguished by their various costumes.

The streets of Zanzibar provide a pageant of Eastern life. Veiled Arab women pass to and fro; Swahili men, in long white *kanzus* and wonderfully embroidered caps, strike a note of dignity as they go about their business, and Swahili women, their ears adorned with small rolls of brightly tinted paper, wearing gaily coloured *kangas*, pass leisurely by, graceful and erect of carriage. Arabs, resplendent with embossed daggers in their belts, come in from the country and perhaps a group of the Omani Arab Sheikhs, wearing gilt embroidered coats and multi-coloured turbans, may be seen discussing the events of the day. An Indian, with velvet cap, long coat and tight trousers, sits on the threshold of his shop patiently awaiting custom, whilst in the street noisy coolies with shining brown skins push heavily laden carts.

If the people seem Eastern rather than African, the whole setting is in perfect accord. Zanzibar cannot boast the ornate mosques and minarets of some other cities, but in its more austere style it has a beauty of its own. Narrow and tortuous streets wind amongst tall stone-built Arab



*In 1936, when the present Sultan's Silver Jubilee was celebrated, his subjects assembled to offer him their loyal congratulations. A procession of Manga Arabs, originating from the Sultan's ancestral home in Oman*



*The Omanis are the aristocracy of Zanzibar's large Arab population. A hint of aristocratic pride is conveyed by the protruding hilt of the long sword which, besides the more bourgeois umbrella, is carried by one of a group of Arabs come to town for the celebrations*



*Africans form the numerically largest section of the population. Here Christian women and children, perhaps descendants of former slaves, are seen leaving the Cathedral erected on the site of the old slave-market*



*An important element in the community are the Indian traders and shopkeepers. This fruit shop, thanks to the fertile soils of Zanzibar, offers an amazing variety for sale—oranges, grapefruit, pawpaws, limes, bananas and pineapples, the latter costing from twopence to sixpence each.*

houses; two houses are seldom built on the same base-line, and thus the streets twist continually. At places they are so narrow as to forbid even the passage of a donkey cart; at others they open into a wide square where modern development includes the installation of a public water supply and a busy crowd of Shihiri water-carriers congregate, each with two large petrol tins slung at the ends of a long pole.

Almost at every turn one is brought face to face with some new pattern in the magnificent carved Arab doors. These doors, brass-studded and with carved framework and superscreen, are relics of bygone days when locked doors and barred windows were necessary as a protection against attack. (The pointed brass studs are considered to be of Indian origin; in

India they were at one time used against war elephants employed in the battering down of closed doors.) It is interesting to study the designs and to trace, on different doors, the evolution of the pineapple symbol from the original inverted fish of the oldest doors. The tail of the fish gradually becomes the whorl of leaves at the top, whilst the scales degenerate into the familiar criss-cross markings of the fruit.

#### AN ISLAND OF CRAFTSMEN

Whilst threading one's way through these narrow streets, one passes all kinds of small shops. In one a Cingalese craftsman is hammering silver to the intricate shapes and patterns suggested by his ingenious mind. A fruit shop offers an amazing variety of tropical fruits in season — bananas, pineapples, oranges, mangoes, lengths of sweet sugar-cane and many native delicacies. The small shop next door is mainly concerned with the sale of tobacco, both for chewing and for smoking. The proprietor spends his time rolling cigarettes or chopping up the areca nuts which, when mixed with lime, are carefully wrapped in a betel leaf to make the betel 'quid' to which the Eastern palate is so partial.

A native barber operates upon his clients as they squat upon the projecting ledge of a house at the side of the street. Numerous shops display cheap Japanese piece-goods while others stock a surprising number of household wares at moderate prices—moderate in the eyes of the European but often requiring much calculation and, of course, interminable bargaining. before a purchase is decided on by the native and paid for out of the little bag of copper coins which he produces from some inner recess of his garments.

Tailors squat at their work or sit industriously treading their sewing machines. Bootmakers with deft fingers stitch and hammer, producing the various designs of boots and shoes which 20th-century fashions demand. Curiously, the



*On festive occasions, young Zanzibaris wear smart hats with elaborate hand embroidery, for despite the influx of manufactured goods, Zanzibar remains a land of craftsmen*





*The streets of Zanzibar are narrow and tortuous. Many parts of this, the principal thoroughfare, are only wide enough to allow the passage of a single motor car*



*At almost every turn one sees a magnificently carved Arab door with pointed brass studs, relic of an age when such stout doors were necessary as a protection against attack*



*The city lies on the western side of the island, and the neighbouring coast abounds in beautiful small bays. Double-outrigger canoes drawn up on a sandy beach of Mangapwani Bay*



*To the south of Zanzibar City the closely packed mud huts of Ngambo, the African quarter, make a complete contrast to the older stone-built part. Here many roofs are 'thatched' with old petrol-tins*



different fraternities of craftsmen love to congregate together. Six or eight tailors' or bootmakers' shops are often passed one after the other. One is reminded of the days of the old Craft Guilds in England before the industrial revolution and the advent of the machine. Zanzibar is still, in spite of the big influx of cheap manufactured goods, a land of craftsmen; one has only to see a native hut in process of construction, the manufacture of prayer-mats by women, the hollowing and shaping of an outrigger canoe or the marvellous embroidery on the *Kofia* (white cap) worked by men, to be convinced of this.

On the southern edge of the stone-built part of the city is a long open space bordering on a creek. This is the 'Darajani', the site of fruit, vegetable, fish and poultry markets. During the early hours of the day it is a hive of bustling activity. The picturesque donkey and bullock carts of the Arabs and Swahilis arrive from the country with loads of cloves, copra, fruit, firewood or charcoal. The animals stand sleepily awaiting the sale of their masters' produce or the purchase of new wares to be taken back to the country.

Across the creek lies the native quarter, appropriately named 'Ngambo', a Swahili word meaning 'on the other side of (the river)'. Close-packed mud huts with a palm thatch make a complete contrast to the older stone-built part of the city. In past times this area was a dangerous, unhealthy swamp, depository for the garbage of the city and the haunt of fierce packs of wild dogs. The house from which Livingstone fitted out his last expedition is situated at the side of Ngambo. In 1866 he thus described it: "from a mile and a half to two square miles of exposed sea beach, which is the general depository of the filth of the Town, is quite horrible. At night it is so gross or crass, one might cut out a slice and manure a garden with it; it might be called 'Stinkibar' rather than 'Zanzibar'."

Now most of the swamp has been re-

claimed and is the site of extensive playing-fields and a golf course. A walk through Ngambo is well rewarded by sights of almost every aspect of native life: women pounding grain for the evening meal with large wooden pestles and mortars; a potter at work by his wheel; a net-maker busy at his craft; children playing with their curious and ingenious toys; a game of cards in progress with the four players squatting on the ground surrounded by at least twenty or thirty interested spectators.

#### THE WEALTH OF ZANZIBAR

The city of Zanzibar is indeed fascinating, but the rural districts vie with it in attractiveness and interest. The one industry on which the island Protectorate is dependent is agriculture. Both for those who are interested in methods of crop production, and those who merely wish to enjoy the beauties of the countryside, a drive through the island is full of interest. Fertile areas where tall clove trees or coconut palms line both sides of the road are frequent; in other places low scrub bush, with here and there a native garden cut out of the rocky soil, indicates the very margin of cultivation where man wrestles with nature for a scanty livelihood. But before describing some aspects of the agriculture of these islands it is necessary to mention briefly the climate and the soils which are responsible for its many and diverse forms.

The climate is equable, showing no great variations in temperature. The rainfall is fairly evenly distributed although there are the great rains ('Masika') accompanied by the south-west monsoon in April and May, and the lesser rains ('Vuli') in October just before the onset of the north-east monsoon.

The variation in soil types is extreme, from the fertile deep-red soils of the central and western portions of the islands, where flourish the clove and the coconut, to the sparse 'pocket' soils of the arid east coast coral country where crop production is



*Small boys display the local talent for craftsmanship in the manufacture of toy models, the smallest details being accurately represented. A model bus, made almost entirely from strips of raffia palm fibre*

confined to the few inches of soil which have accumulated in the hollows of the coral rag. There are extensive areas of sand, in many cases underlain by clay, and fertile valley soils formed by the erosion of neighbouring hillsides are the scene of extensive rice cultivation. Variations in soil type account for differences in systems of agriculture.

#### THE CLOVE INDUSTRY

The prosperity of Zanzibar is bound up with the cultivation of the clove. The annual export, approximately 10,000 tons, represents over 80 per cent of the world's total supply. Ports in all the five continents appear as destinations of this valuable spice in every monthly shipping-list, and ships from America, Europe, Australia and Japan call to collect their complement of bales of cloves.

The story of the introduction of cloves

to these islands is a romantic one. Up to the 18th century the world's clove supplies came from the Molucca Islands, where the tree is an indigenous forest plant. Such was the value of the clove and other spices that the discovery of an all-sea route to the Spice Islands, as they were called, was the main objective of the early European navigators who discovered and rounded the Cape. Once this route had been established great rivalry, which entailed continual piracy and intrigue, existed between the various sea-powers of Europe for command of the trade. In 1623 the Dutch finally became supreme and vigorously set to work to safeguard their monopoly. Clove trees in most of the islands were destroyed and cultivation was confined to Amboyna where it was kept under the strictest supervision. In spite of this, plants and seed were stolen by the French in 1770 and taken to the Île de



France (Mauritius). A few plants were successfully established and became the nucleus for further propagation.

Clove plants were probably first introduced into Zanzibar from Mauritius at about the end of the 18th century, for by 1832 a flourishing small industry already existed. To its first Sultan, Seyyid Said bin Sultan, Zanzibar owes the development of the clove industry which, within half a century of his death, dominated the world's spice markets. Seyyid Said, a man of energy and foresight, set to work soon after his arrival in Zanzibar in 1832 to develop the promising new industry. Owners of plantations were compelled to plant cloves under the threat of expropriation of their land. With the skill of the Arab owners and the careful cultivation made possible by abundant slave labour, the trees flourished and the industry developed at an amazing rate.

In 1872 most of the plantations of Zanzibar were wrecked by a disastrous hurricane. Fortunately the Pemba trees escaped, and for a few years the producers there enjoyed great prosperity, since their cloves were in considerable demand at high prices. These prices stimulated both further extension of the Pemba plantations and rapid replanting in Zanzibar, with the result that more cloves than ever were produced.

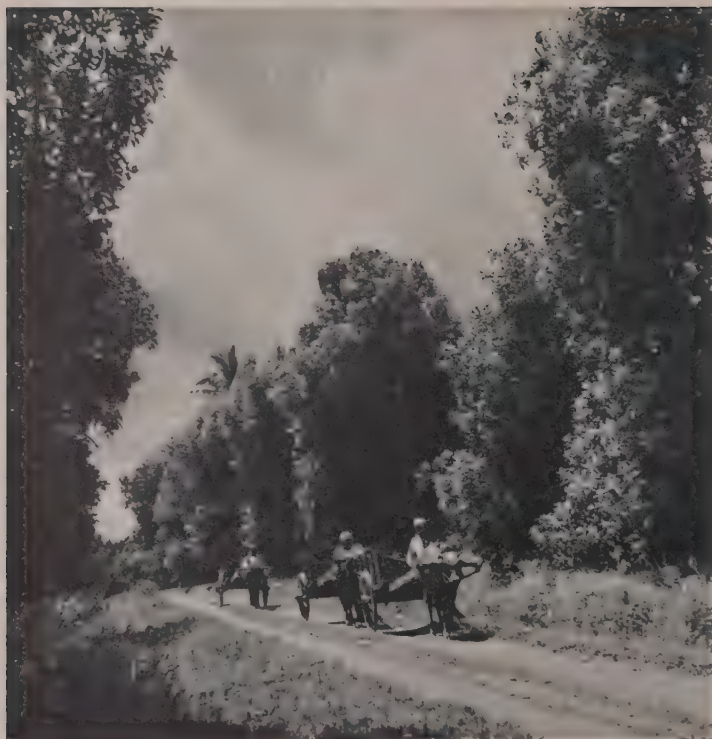
Few people are aware of the many uses to which the clove is put. Almost 3500 tons a year go to the great spice markets of India and 4000 tons a year are exported to the Dutch East Indies, where they form the basis of the 'Kretek' cigarette industry. Europe and America import between them about 2500 tons of Zanzibar cloves which are principally used for distillation. From clove oil it is possible to produce synthetic vanillin, an important product in the perfumery and confectionery trades. The oil is also used in medicine and for scientific purposes.

The clove of commerce is the unopened flower-bud of the clove tree, which is tall

and cylindrical in shape with leaves somewhat resembling those of the myrtle tree. Thirty to forty feet is the usual height attained by the Zanzibar trees, although those in Pemba Island are sometimes 60 or 70 feet high. The cloves grow in clusters at the ends of the branches and the difficulty of harvesting by hand from the upper portions of the tree can be imagined. There are two crops in the year which each follow some months after the monsoon rains; the south monsoon crop is generally harvested from July to September or October whilst the north monsoon harvest follows one or two months after the rains of that name. It must not, however, be thought that two harvests a year mean a constant supply of cloves. Yields are very capricious. A good harvest may be



*Partners: a country Manga with his donkey, indispensable for the transport of agricultural produce to town and of wares from town markets for the shop which he probably keeps in the country*



*The prosperity of Zanzibar is bound up with the cultivation of the clove, the annual export, approximately 10,000 tons, representing 80 per cent of the world's total supply. Zanzibar clove trees are thirty to forty feet high*



*On the clove plantations, the beating of a drum at dawn summons the pickers to the central drying-floor, whence they are despatched to work. While men climb the trees, women and children pick the clusters of buds from the lower branches*



*A second drum, sounded at about 3 P.M., recalls the pickers who, squatting on mats, proceed to separate the pinkish-green flowerbuds from their stems. They are then spread out to dry and turn into the familiar golden-brown clove*



*The valuable spice is exported to all parts of the world (though mainly to India and the Dutch East Indies), packed in large bags made from the fibre of the date palm, the name of the port of destination being stencilled on each bag before despatch*



*Bales of cloves being loaded into lighters for transport to steamers anchored out in the harbour. In the background is Zanzibar City, with the Palace to the left of the tall tower.*

followed by two seasons of practically no yield, whilst at other times two good seasons may fall together.

It is evident that the early clove plantations were carefully laid out, for, in contrast to the haphazard appearance of coconuts and other crops, the clove trees are always planted in well-spaced lines. Cultivation is to this day carried on by hand hoeing. When the buds are mature

the harvest commences. It is probable that the same routine exists today as was used in the days of slave labour.

The beating of a drum at dawn summons the clove pickers to the central drying-floor. Here they are told what area they may pick and are sent off under the escort of a headman. Picking continues through the hot hours of the day. Women and children, using hooked sticks, pick the

lower branches from the ground, whilst men climb the trees, tie in the branches with ropes and thus get access to the bunches of cloves. The climber's task is not an easy one for many of the trees are infested by small red ants which, on account of their bite, have earned the appropriate name 'hot water'. They are, incidentally, responsible for a good deal of harvest damage to the trees for pickers will not stay long up a badly infested tree and therefore break off many of the upper branches which they pick under decidedly more comfortable conditions on the ground.

A second drum sounded at about 3 P.M. recalls the pickers, who, squatting on mats, proceed to separate the cloves from the stems. When this operation is completed, each individual brings forward his pile of pinkish green buds, which are measured and paid for and he then goes off to his evening meal and rest, in preparation for the next day's harvesting. The cloves are spread to dry on mats or broad cement floors and, with favourable weather, will in four or five days turn into the familiar dry golden-brown clove.

#### COCONUTS AND OTHER CROPS

From the sea Zanzibar appears as a country with low undulating hills clad from shore to horizon with a dense growth of coconut palms. This impression is confirmed by a journey inland, for there are few places where the tall coconut is not to be seen. Although the clove is to Zanzibar the most important tree, yet the cultivation of the coconut occupies a far larger area.

The principal use to which the coconut is put is the manufacture of copra (the dried kernel) which is exported to the extent of some 12,000 tons annually. Copra is dried in the sun or in one of several types of kiln which may be seen at intervals along any of the roads of the Protectorate. There are, however, many other local uses for the various products of

the palm. The nut itself features daily in the diet of all the country population. The husk, buried for several months on the seashore, provides the fibre for the manufacture of coir rope. At the villages of Makunduchi or Kizimkazi one may see women digging up the retted husks and beating out the fibre against some rocky prominence on the shore.

Even the shell of the nut is to be found for sale as fuel in towns and villages. The leaves of the coconut provide the thatch of countless native huts throughout the Protectorate. Palm-leaf baskets are always used for the transport of fruit and other products to Town. Few visitors leave Zanzibar without tasting the celebrated 'madafu' or milk of the unripe nut.

Although no other crops assume great importance for export, there is extensive cultivation of local food supplies. Rice cultivation is confined mainly to the valleys and is mostly carried on in Pemba. Almost everywhere plantings of cassava are a familiar sight. Bananas flourish in abundance on the richer soils. One or two areas have flourishing orange plantations and it is said that the Zanzibar oranges are without comparison on the East Coast. Occasional plantings of tobacco are also to be seen. These plants are most carefully tended and, when first transplanted, each seedling is shaded by an inverted coconut husk and watered every evening. Much of this tobacco is exported to Italian Somaliland, the balance being consumed locally for chewing or the manufacture of snuff.

It is not possible to conclude a description of agriculture of these islands without referring to the 'Wanda' agriculturists. The 'wanda' is the eastern coral rag country where village communities annually clean and burn a part of the bush to make their 'gardens'. On casual inspection one would doubt the existence of any soil at all. The whole area presents the appearance of barren rocky prominences, and yet after the monsoon rains





*A coconut climber, with feet shackled in twisted ropes and knife sheathed in dry banana-stem fibre*



*Besides copra (the dried kernel), coconuts provide husks, the fibre of which is manufactured into coir rope. Husking coconuts*



*Their shells are used as fuel, their milk affords a delicious drink; and the coconut palm leaves, excellent thatching material, are also fashioned into fruit-baskets*



*An ancient gun dating from the Portuguese occupation of Zanzibar*

this 'desert' blossoms forth with green crops of maize, millets, peas and other food crops. One cannot but admire the energy and perseverance of the 'wanda' cultivator who, with his crow-bar hoe, continually strives against most difficult natural con-

ditions. Even the lack of soil and rainfall are not all, for extensive stone walls have to be constructed against the wild pig, which flourishes in these regions and is only too ready to plunder the hard-won products of the cultivator.



# Places and Products

## III. North Wales Slate

by A. K. HAMILTON JENKIN

*The bell-founding industry of Loughborough, described in the last article of this series, might just as well have taken root almost anywhere else. The position of the Dinorwic quarries, on the other hand, was decided by the existence of a mountain of slate within a few miles of the sea. Here the extraction of the product has had a dramatic effect on the scenery of a place already endowed with a setting of exceptional grandeur*

THE mountain quarries of North Wales, producing 85 per cent of the total output of slate from the British Isles, are not only one of the 'sights' of the Principality, they rank among the most spectacular man-made excavations in the world.

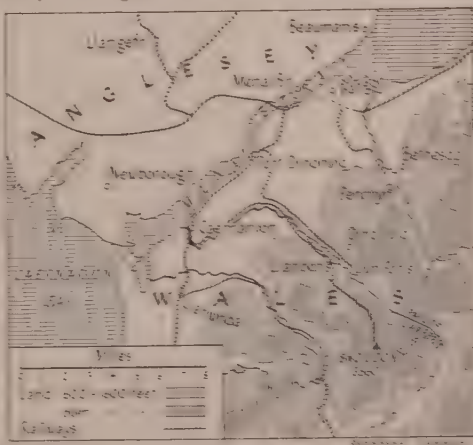
The view of Dinorwic from Llanberis, or of Penrhyn from Bethesda, [write the authors of *The Land of Wales*] takes one's breath away, so terrific are the results of two centuries' chisellings and blastings of man. One above another rise the tiers of rock, each as big as a sea-side cliff, ten, fifteen or twenty terraces stepped back and back to the very mountain top itself. Huge tips of waste topple into fresh mountains, or tumble into lakes and valleys far beneath. Tiny figures crawl like ants among the clefts, engines and trains puff sideways on the shelves, steep inclined tracks run like ladders leant against the face.

The colossal size of the Dinorwic quarry is further enhanced by the grandeur of its setting. At its foot lie the dark green waters of Llyn Peris, whose glassy surface reflects the shadow of the drifting clouds. All around stand the wine-coloured mountains, their sides slashed by gleaming cascades, their tops concealed among the mists or capped by purple rain-clouds. One of the best general views of the quarry is obtained from the road, where it emerges at the northern end of the Pass of Llanberis. From here the mighty terraces of slate are seen as in a panorama, their twenty tiers or more rising to a height of 1800 feet above sea-level. Nearer at hand the face of the quarry presents an amazing study

in colours—rose, russet and sea-green mingling with bands of purple and grey. These brighter shades are becoming increasingly popular for 'artistic' roofing, and are highly esteemed by some architects.

The quarry itself covers an area of 700 acres and employs about 2600 men. Practically all are Welsh speakers, a few of the older men knowing no English. They are a cheerful, wiry lot, often tramping long distances across the mountains to their work. Many of them possess small-holdings and keep a few sheep to occupy their spare time.

The output of slates from the Dinorwic quarry during the last century-and-a-half of working must run into thousands of millions. This, however, represents only a small part of the material which has actually been quarried. The inevitable waste





*The view from the Dinorwic quarry is magnificent, embracing the whole Snowdon range. All day long throughout the year the waste rock is tipped in tinkling cascades down the mountain side, and into the lake beneath.*  
*(Below) Some of the rock galleries carved out of the mountain face.*





from a slate quarry amounts on an average to 80 per cent of the rock extracted, and its disposal presents one of the most costly problems with which the management has to deal. All day long throughout the year the waste is tipped in tinkling cascades down the mountain sides and over the land beneath. Thousands of tons find their way into the Llanberis lake, whose area has already been reduced by half and is still being continually curtailed. Thus it is true to say that man, in his efforts to obtain the modicum of useful slate, is gradually moving a mountain and filling up the valley beneath.

The slate deposits of North Wales belong to the oldest strata of the earth's crust—the Cambrian and Ordovician series. Slate itself is composed of a substance which was once a fine-grained sediment akin to clay but which, as the result of heat and the enormous pressure exerted upon it when it still lay buried deep beneath the earth's surface, has acquired the property of cleavage. In the course of geological ages the superincumbent mountains became eroded, and this, combined with upward earth movements, resulted in the exposure of the vast deposits which are being worked in Wales today.

The intense hardness of slate, combined with the ease with which it can be split into sheets of smooth and even surface, render it the ideal material for roofing. It is practically impervious to damp, absorbing less than one six-thousandth of its weight of water, and consequently does not laminate under the action of frost. Its value for building purposes was certainly appreciated at an early date. Purple slates from the Bethesda area have been found at the Roman town of Segontium, near Caernarvon, where thick slabs were used for flooring and thin sheets as roofing tiles. In many parts of the country buildings, centuries old, still bear roofs of Dinorwic or Penrhyn slates, which appear as sound today as when they were laid. Nor has slate proved less satisfactory under

modern conditions. Being uncorrodable, it is unaffected by the acids present in the rainwater of most industrial towns and is capable even of withstanding the direct action of fumes emanating from chemical factories and glassworks.

For many centuries Welsh slate was quarried in a desultory fashion. Scattered pits were sunk wherever an outcrop appeared, and were worked by small groups of men with little or no capital.



*The scale of the workings may be judged from the figures of the men here seen engaged in removing loosened blocks of slate*





*In preparation for blasting, holes are drilled to receive the charges, with pneumatic machines capable of boring to a depth of 14 feet. Often the driller hangs suspended against the sheer rock face*

*At regular intervals, and simultaneously throughout the workings, the charges are fired. When the warning siren sounds, the men retreat into specially constructed shelters, with roofs and sides at least a yard thick, for protection against the falling rock*





*Next follows the reduction of the large slate blocks into convenient sizes for removal to the splitting-sheds. This operation, which is performed partly with chisels and crowbars, and partly by hammering the block which cracks in directional lines known to the quarryman, requires care and skill*







*Narrow-gauge railways, used in moving the rough slate blocks along the galleries, ramify into every corner of the great quarry. There are more than 50 miles of such railways*

When a fall of ground took place through the undermining of the surface the pits were quickly abandoned. As late as the middle of the 18th century the use of slate was largely confined to the neighbourhood of the quarries, but with the growth of towns during the Industrial Revolution the demand became widespread. Transport, however, still presented great difficulties. Aiken, in his *Journal of a Tour through North Wales, 1797*, describes one of the methods by which the slates were brought down from the mountain quarries:

The vehicle in which they are conveyed is a small sledge that will contain three or four cwt. When loaded, it is drawn to the edge of the declivity; a man places himself before it, with his face towards the sledge and a rope round his shoulders. Then grasping the sledge with his hands and raising his feet from the ground, the load together with the conductor begins to descend along a narrow winding path down the scarp, almost perpendicular, side of the mountain. The motion, though

moderate at first, accelerates very speedily; and the business of the conductor is to govern as well as he can the increasing velocity by striking the ground with his feet and by opposing them to the projecting points of the rock, in order to retain the carriage in the proper path. The least inattention or want of dexterity is certain destruction; and yet does this man every day hazard his life four or five times for the trifling pittance of about twopence a journey!

Welsh quarrying on an extensive scale dates only from about 1770 when Richard Pennant, first Baron Penrhyn, opened up the famous quarry of that name at Bethesda. During approximately the same period the Dinorwic quarry was being developed by the family of Assheton-Smith.

Notwithstanding the introduction of capital, however, and large-scale operations, the Welsh quarryman retains to a very considerable degree the status of an independent worker. The men are divided



into 'parties' who enter into 'bargains' with the management to turn a specified section of the quarry into slates for a stipulated price. Whilst some members of the party engage in extracting the rock, the rest are occupied in converting it into slates. Each load of slate block as it leaves the quarry has the number of the particular gang clearly marked upon it, the men in the 'splitting' sheds relying upon their quarry partners to keep them supplied with good quality material. At the end of the week the 'bargain taker' alone is paid, and divides the money amongst his fellow-workers. Each party is thus a little company in itself, its members working in close co-operation and being subject only to certain regulations governing the general management of the quarry.

The first operation of the quarryman consists in boring the holes for blasting. This often necessitates the workman being suspended against a sheer wall of rock,

where a fall would be fatal. Despite the dangers, however, accidents are rare, the men being trained to such work from boyhood. Whilst dynamite may be used for blasting the waste rock, the slate itself is always loosened with gunpowder, over 90 tons of which are used in the Dinorwic quarries annually. The effect of gunpowder is to exert pressure only on the lines of least resistance, and by this means blocks of slate weighing up to ten tons are dislodged from the quarry face without shattering.

Blasting takes place at regular hours and simultaneously throughout the quarry, this system being essential for the safety of the many hundreds of men engaged in the workings. Three minutes before the hour of blasting an electric siren sounds the warning. Immediately the roar of the pneumatic drills ceases, the men down tools and all except those required to fire the trains of gunpowder retreat into round



*The horizontal galleries are connected by incline railways, some of which have a gradient of one in two. On these double lines, the weight of the down-going trucks hauls up the 'empties'*

'pill-box' shelters which are provided with in easy access. These stone-built shelters have narrow doorways, and roofs and sides which are required to be at least a yard thick. As the activity of the great quarry slows to a standstill, a second signal is given to light the fuses. There follows a period of profound silence; then suddenly puffs of white smoke break from the rock faces and the quarry booms and thunders with a crescendo of explosions. Huge stones can be seen hurtling through the air like giant birds, whilst the roar and echo of the blasting is mingled with the sound of falling rock. Five minutes later the siren sounds again, and the men return to their work. Each party is required to keep count of its own blasts, and should any charge fail to explode all the men in the vicinity are ordered to remain in shelter for a further half-hour.



*Making roofing slates. The splitter's job is one in which no machine has yet been able to supersede the skill of man*

The blocks of slate dislodged by blasting are subsequently split into slabs of about 8 feet long and  $2\frac{1}{2}$  inches thick. This is done partly with wedges and in part by merely hammering the block, which splits readily enough in the hands of an experienced quarryman who knows the 'pillar-ing' lines.

From the quarry the slate blocks are loaded either onto the incline wagons which connect the various 'sinks' and 'galleries', or are raised by electrically-operated aerial rope-ways. These consist of cables stretched from one spur of the mountains to another, with vertical pulley ropes which can be lowered to any desired point on the quarry floor. It is an impressive sight, on looking up, to see the great blocks of slate sailing leisurely overhead, supported on a steel rope which from a distance appears no thicker than a pack-thread. Owing to the enormous size of the Dinorwic quarry the dressing sheds are widely distributed in various parts of the workings. A thousand feet up the mountainside, often hidden among the clouds, one comes across electric motors driving heavy machinery, whilst higher still little locomotives will be met with drawing trains of laden trucks to the clearing-stations on the topmost galleries.

On reaching their destination the slate blocks are distributed—some to the splitting sheds for slate-making, others to the plane house for slab work. In the preparation of slab the blocks are clamped on to mechanically-operated steel beds, whilst revolving saws bite their way through them with a powerful sizzling noise. For many purposes the natural split surface of the slate is unsuitable, and the slabs are subsequently levelled by planing machines and, where necessary, sanded and polished. Among the many uses to which slab is put may be mentioned billiard tables, electrical switchboards, acid vats, water cisterns, dairy shelves, window sills and tombstones. Enamelled slate slabs are occasionally used as a substitute for marble.

*'Dressing'—the final process which trims off the rough edges of the slates and cuts them to standard roofing sizes. This is effected either by holding them against the revolving blades of a machine, somewhat resembling those of a large lawn-mower*



*—or with the aid of a mechanical guillotine which removes the protuberances from a slate placed on a sharp edge*



*—or by the older method, that the guillotine imitates, of hand-dressing with short, quick strokes of a knife*





In the manufacture of roofing tiles the 'splitter' on receiving his supply of blocks places them against a circular saw which cuts them, at right angles to the cleavage, into pieces rather larger than that required for slates. These pieces, of course, are still about  $2\frac{1}{2}$  inches thick. In order to reduce them to slates the splitter rests them against his leg and then applying a broad chisel to one edge strikes it with a mallet. After one or two taps an even crack appears, and the two layers can then be gently pressed apart. Each piece in turn is split again until it is finally reduced to slates of roofing thickness.



*After being examined and classified, the slates are tightly packed in small trucks ready for removal*

The cleavage of slate varies considerably. For demonstration purposes some of the best Welsh varieties have been split into strips of  $\frac{1}{8}$  of an inch thickness, when they will bend like veneer of wood. In practice, however, slates are rarely made less than  $\frac{1}{8}$  inch thick, a  $2\frac{1}{2}$ -inch block thus yielding, on an average, fifteen slates.

The splitters are skilled craftsmen, and it is fascinating to watch the speed and accuracy with which they find the cleavage point when splitting and re-splitting a thinnish block of slate. This is a job which depends entirely on 'feel' and in which no machine (though many have been tried) has yet been able to supersede the skill of man.

The slates are subsequently 'dressed' either by hand—in which case they are placed on a sharp edge and the protuberances broken off with the short, quick strokes of a heavy knife—or else by holding them against a guillotine. The latter is equipped with revolving blades somewhat on the principle of a very large lawnmower. These blades trim off the rough edges to the exact dimensions of standard roofing slates—varieties picturesquely known to the trade as 'Princesses', 'Duchesses', 'Countesses', 'Ladies' and 'Little Ladies'. When a sufficient number of slates have been accumulated they are placed in small trucks running on narrow gauge railways, of which there are upwards of 50 miles in the quarry. Two dozen locomotives are continuously employed in drawing these little trains along the galleries to the nearest incline. Down the inclines—some of which have a gradient of one in two—there is a double line. At the top the trucks are attached to a steel wire rope with a breaking strain of 30 tons which winds round two great drums. The weight of the down-going trucks hauls up the empties, no other motive power being required. Each gradient is complete in itself, with junctions communicating with subsidiary galleries to the right and left.



*(Above) A sort of main narrow-gauge line, extending right round the lowest quarry-level, communicates with a larger line onto the trucks of which the quarry trucks are loaded, four at a time, for the journey to Port Dinorwic. (Below) Here the slates are transferred aboard ship*





*The Company's private harbour of Port Dinorwic on an inlet of the Menai Straits. The inlet was lengthened and widened some years ago to admit the ships of the Company's fleet*

After being transferred from one to another of these gradients, the trucks at length reach a sort of main line which runs round the entire length of the lowest quarry level. Here the slates are examined and classified. Then, as the narrow-gauge line is unsuited for the seven-mile journey over fairly level country to the port, the little trucks are pushed onto larger ones which stand waiting at a lower level to receive them. In this way the 'trunk line' trains, carrying as much as 130 tons of slate, are despatched to the company's private harbour at Port Dinorwic.

The terminus of the trunk line, however, is still not quite the end of the journey. The last quarter of a mile consists of a steep incline and at the head of this the

small trucks are once more wheeled off the larger ones and attached to a wire rope which lowers them to the quay-side.

Port Dinorwic, or Velinheli to give it its old Welsh name, is a tiny inlet nestling on the shores of the Menai Straits. It is entered by lock gates and has a dry dock for the repair of ships. From here the company's fleet of small steamers carries the products of the quarry to Liverpool and all parts of the British Isles, more particularly to Lancashire, Scotland and the East Coast.

At Liverpool the slates for export are reshipped and thence go out to every corner of the world—to Germany, South America, India, the Cape and even so far afield as Australia.





Photograph by S

The *gajars* of the Camargue provide a spectacular accompaniment to the festival of Les Saintes-Maries



Wearing sombreros and gaily coloured shirts, the *gardians* carry trident-topped poles used in driving the wild cattle of the Rhône delta



Their horses are of a breed introduced long ago by Saracen invaders. At the culminating point of the festival they ride into the sea





Gypsy lasses participate as of right in every gaiety of the occasion; for was not Sara, their patron saint, the companion of the Holy Marys?



Down to the sea the richly dressed image of dark-skinned St. Sara is borne on the shoulders of gypsies singing songs in her honour



The images of the Holy Marys in their little blue boat, which are carried in procession as well as that of Sara, attract equal attention





Beneath the vault of the crypt where the bones of Sara the Egyptian have rested for 500 years, a gypsy woman lights a candle to her patroness



The Curé of Les Saintes-Maries-de-la-Mer, alone in the ancient church which is periodically filled to overflowing with pilgrims

# The Gypsy Festival at Les Saintes-Maries-de-la-Mer

by F. NEUGASS and F. MOORE

*Legend relates that Marie Salomé, sister of the Virgin, Marie Jacobé, mother of the apostles James and John, and other friends of Christ, fleeing from persecution in Palestine, were miraculously wafted to the shores of Provence. The two Marys, with Sara their Egyptian servant, were buried in a church near one of the mouths of the Rhône, where their relics were discovered and re-enshrined by René of Anjou, Count of Provence, in 1448. Twice a year, in May and October, this church is the centre of the festival herein described*

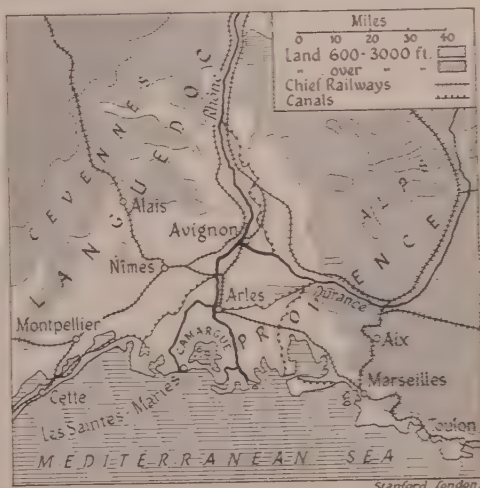
THE Camargue, a vast plain, absolutely flat. As far as the eye can reach great shallow ponds, endless bogs and heathy moorland, where, in the interstices of the sparse vegetation, the salty soil gleams white.

But the very conditions that prohibit human life make of the Camargue a paradise for all manner of strange, rare birds such as flamingoes and ibis. Many too that are normally birds of passage, having once found their way here, never leave it again. There is food and to spare for them all in the swarms of gnats and mosquitoes that breed in the swamps and are the plague of the entire district.

Yet the Camargue has other aspects as well. Along the two arms of the Rhône by which it is enclosed there are tracts of fertile fields and blue-gleaming vineyards. Most of the solid land, however, consists of extensive steppes over which roam herds of white horses and wild black bulls. Flocks of sheep, almost indistinguishable from the grey vegetation, graze peacefully, heedless of the ferocious cattle. Here a few villages and tiny hamlets manage to exist, and a number of isolated farmsteads and small, primitive shacks. These are inhabited by the *gardians*. Sometimes several of them will live together, sometimes one by himself, and the nearest human habitation may be over twenty miles away. Fine-looking fellows and magnificent horsemen they are, these Buffalo Bills of the Camargue. Mounted on the white horses

which they themselves have broken in, and armed with a long-shafted trident and lasso, they drive the cattle and horses from one pasture to another and secure the bulls whose ultimate destination is the arena at Les Saintes-Maries, Arles or Nîmes. It seems unbelievable that a life so primitive should continue in our time so near to the heart of Western civilization.

For some while now we had been conscious of a refreshing sea breeze. And suddenly in the distance we became aware of a curious triangular tower—a splash of light against the deep blue Provençal sky—the tower of the fortress-church of Les Saintes-Maries-de-la-Mer, which is the full name of the tiny capital of the Camargue, famous for its gypsy pilgrimage and im-







*Gypsy pilgrims from all over Europe, when frontier regulations permit, gather round the church of Les Saintes-Maries-de-la-Mer to celebrate the festival of their officially unrecognized patron saint Sara*

mortalized by Mistral in *Mireille*. Usually the little white houses of the fisherfolk cluster in peaceful seclusion about the church, which has been their protector, physically as well as spiritually, for so many centuries. It is not a fortress for nothing, nor are those grim openings for pouring boiling oil or stones down on the enemy a decoration. For the church was a refuge to all the population of that exposed, low-lying land in the days when Saracen pirates infested the Mediterranean seaboard.

But there is no sign of quiet or seclusion during the days of the big pilgrimage. Booths and stalls are put up all round the church, and what little hotel accommodation is available is utterly insufficient for the hosts of visitors, who are consequently boarded out with the cottagers. Most of the pilgrims, however, are independent; they come in their caravans, or bring tents

—gypsies who congregate here from all over Europe to take their part in the processions, and to pray to their patron saint, Sara.

This saint, who has never been officially recognized by the Church, was, so the legend goes, the dark-skinned servant of the two eponymous Marys—Marie Salomé and Marie Jacobé, the aunts of Christ. Soon after His death they drifted ashore at this spot in a small open boat and settled there, devoting themselves to the poor and sick, performing miracles and spreading the Gospel. And because Sara is supposed to have been an Egyptian, the gypsies have adopted her as their special saint—that, at any rate, is the current explanation.

On a large open space between village and sea stand rows upon rows of dirty green caravans and wagons, their horses and donkeys somewhat disconsolately cropping the sparse, sapless grass; and

## THE GYPSY FESTIVAL AT LES SAINTES-MARIES-DE-LA-MER

among them great numbers of all manner of cars in every stage of respectability and dilapidation, for the modern gypsy finds horse-travel no longer to his taste. Though the children may beg, and mothers, their youngest on their arm, may ask alms, this is really a matter of principle. Begging is practised by the women and children of rich and poor alike and does not connote destitution. Most of them are not exactly rich, but quite comfortably situated; they often own several houses, many are prosperous horse dealers, and they are obliged by the authorities to send their children to school.

On the terraces of the cafés the gypsies (actually we should call them by their proper name—'romanies' or 'gitanes') sit together in groups, stout and powerful-looking men, slender youngsters with curly

dark hair and velvety eyes. The women squat in front of their vehicles, maybe on the upholstery which has been pulled out of the car, introduce their latest-born to each other, cook the family's dinner and gossip. In the café, Emmanuel, the gypsy king, is sitting with his cronies over an apéritif. He has ruled his subjects, very democratically, for many years. He himself will not have anything to do with the title 'king' and simply describes himself as the chief.

He combines two offices which must at times be in conflict with one another, for he is a member of the local constabulary, yet among his own people he has, according to gypsy lore, absolute power of life and death. He invites me to join his party for a drink. In his curious mixture of Catalan, Provençal and French he de-



F. Neugass

*Many come in motor cars; all are equally at home in the open air, camping and conducting their family life with complete indifference to the gaze of other pilgrims and sightseers.*

plores the fact that owing to the Civil War in Spain and to Mussolini's strict frontier regulations, so many of their brethren are unable to come.

"Hitler's and Mussolini's politics", so he laments, "and the Austrian 'Anschluss' have completely separated us from our brethren in Hungary, Czechoslovakia and Rumania. Such things as frontiers shouldn't exist. We owe it to the dictators that our families are torn apart. . . . Shall we live to see the day when the bells of Les Saintes-Maries call all of us together again to mass?"

This is Emmanuel's great day. All his subjects come and pay their respects to him. He knows their troubles, has words of comfort for the distressed and money for the poor. The musicians play to him.

Boys and girls dance before him with inimitable grace and display their conjuring tricks, which he applauds.

The dimly lighted church has neither transept nor aisles; its walls are covered with votive tablets given by grateful pilgrims. And in a shrine high up in the tower rest the mortal remains of the two Marys. Today the church is packed to overflowing. Solemn services succeed each other. Bareheaded gypsy girls press forward. Then a window above the raised choir opens, and to the impassioned singing of hymns, to the sweet refrain of "Salut, salut, Saintes Maries", punctuated by shouts of "Vivent les Saintes Maries, vive Sainte Sara", the shrine slowly, slowly descends. All hands stretch upwards. For he who is the first to touch the reliquary is blessed above all others. A gypsy father raises his little boy. The small hand is uplifted above the straining multitude. The shrine comes to rest on a table behind the altar, embowered in candles and flowers. The crowd surges forward to kiss and fondle the simple metal coffin with its childlike paintings of the two Marys.

All night long there are services in the church. Hundreds of candles flicker in the dark choir above the shrine. Women sit on the benches, letting their rosaries glide through their fingers. Priests and monks, one after another, mount the pulpit to extol the Saints and exhort the congregation to practise their virtues. The heat near the candles is unbearable. Sometimes a woman faints. Then she is carried out into the cooling night breeze.

A wheeled chair is drawn close up to the shrine, in it a crippled boy, pale and with twisted features. His thin transparent hands clutch the reliquary from which he wills his regeneration. The cross of his rosary rattles eerily against the shrine.

It is quieter below, in Saint Sara's crypt, which she shares with a Christian and a pagan altar, one wall billowing with pitiful under-garments, the votive offerings of the



F. Nougass

*At the entrance to the crypt, the images of the Holy Marys preside at the succession of services held in their honour*





*F. Neugass*

*On the second day of the festival, the images of the Saints are carried to the sea by gypsies in solemn procession, preceded by girls in Provençal costume and flanked by mounted gardians of the Camargue*



*F. Neugass*

*As they enter the sea there is wild enthusiasm*

faithful. The heat, the scent of candles and incense are stupefying. Gypsy men are curled up on the steps, gypsy women lie on the floor on rugs. One crouches on the altar-steps at the feet of Saint Sara with a child in her arms and sleeps. She is beautiful with fine, regular features, a living replica of the saint who stands above her so protectingly. A child starts to cry. The mother awakens, opens her dress and nurses the child. Gypsy lads sit on a bench, gaze silently into the flickering candles and smoke cigarettes—yes, they smoke in the sanctuary of their patron saint. But they are not conscious of any wrong-doing, and cheerfully blow the smoke across the hallowed candles.

On the second day the tiny town is too small for all the thousands of pilgrims that congregate there. From early in the morning there is a constant stream of coaches and buses, utterly incongruous on these lonely roads across marsh and steppe. From all over the Midi and beyond they come—from Arles and Avignon and Marseille of course, but also from Cannes, Toulouse and Perpignan, right down to the Pyrenees, for the saints are renowned far beyond the borders of Provence. Smart cars arrive from Bordeaux, Paris, Lyon and Geneva. Film companies, too, send photographers. Their cars are stationed at all strategical points.

The gardians of the Camargue on their white horses play an important part in the procession. They wear the traditional costume—cream or white close-fitting trousers, brightly coloured shirts, black velvet jackets and sombreros. Most of them are in the service of the biggest landed proprietor of the district, the Marquis Baroncelli, whose family has owned the land for many centuries and who traces his descent from the Troubadours. He is no longer young, but he is a fine, supple figure of a man. He seems to be one with his white horse. It rears obstreperously but he has no difficulty in calming it. Like all the gardians he holds

in his right hand the long trident-topped pole. Ordinarily it is used to keep the wild cattle in order, today it will be raised in salute to the Holy Marys and Saint Sara.

In a double row the gardians wait at the entrance to the church for the procession to issue forth. A dense crowd, numbering many thousands, has collected on the little square in front of the church, so that from here at least they may participate in the mass which is transmitted by powerful loud-speakers. Then from the church doors there emerge choir boys with cross and censer, young girls in the gracious Provençal costume and behind them, with wild hair, Emmanuel and his followers, who bear on their shoulders the images of the Saints. With folded hands the two Marys stand upright in a blue boat. They sway above the throng which crosses itself at their approach. The gardians on their horses open a pathway through the multitude.

It is not an easy matter. The seashore is densely packed with a most diverse humanity. Fisherfolk, peasants, gypsies, well-to-do pilgrims and sightseers of all ages are tightly wedged together on the water's brim, their feet lapped by the waves. Everyone joins in the hymn, as the procession, led and flanked by the gardians, approaches. Suddenly the gardians detach themselves. They plunge into the sea, line up in a row turned landwards and lift their tridents in greeting. The gypsies follow them, fully garbed, with the Saints on their shoulders and shout in frenzied abandon "Vivent les Saintes Maries! Vive Sainte Sara!"

In a boat close in to the shore stands the Archbishop of Aix in all the splendour of his festive robes, holding his crozier in his left hand. His right hand is uplifted in blessing—of the sea, of the gypsies in the water and of the riders on their white mounts.

The rest of the day is given up to feasting, gaiety and popular contests. Some-



*The gardians, raising their tridents, salute the Saints. The Camargue horses are born black and turn white between their fourth and fifth years*





F. Neugart

*Finally the Archbishop of Aix, from a boat near the shore, blesses sea, gypsies and gardians*

how the cafés and restaurants cope with the overpowering influx of customers. Pilgrim families unpack their food-baskets and picnic on the beach. No one need have any fear of possessions disappearing through nimble gypsy fingers—no gypsy will steal in Les Saintes-Maries; it would bring him bad luck.

In the arena under the fierce afternoon sun there are rodeo games, bull and horse contests, leavened with the gentler Provençal pastimes of *farandole* dancing and a

processional ride, during which every gardian bears on the crupper of his horse a lady in Provençal costume.

In the gypsy camp the fires smoke. The smell of frying fish assails the nostrils. The music played by the gypsies and the penetrating strains of the roundabout intermingle with the sounds of hymns being broadcast from the church: "Salut, salut, Saintes Maries". It is the string on which the events of the past two days have been threaded.

# On an Australian Sheep and Cattle Station

by GEOFFREY MOREY

*One third of the world's wool supply is provided by Australia's 110,000,000 sheep; and nearly two-fifths of that Continent's total exports consist of wool. The typical productive unit for this colossal output is the big sheep station, such as that which Mr Morey visited*

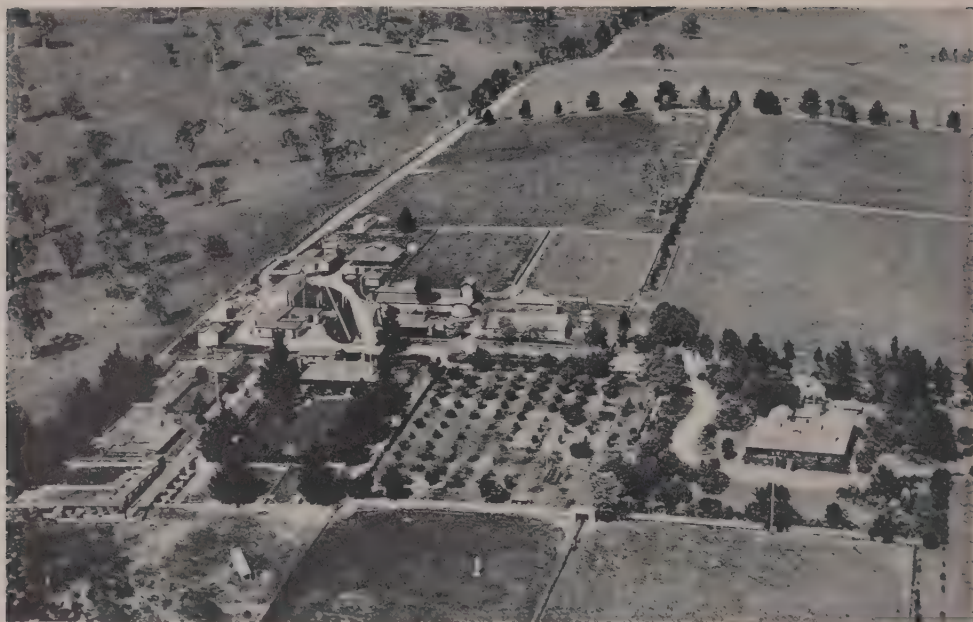
A SHORT time ago I received an invitation to spend a few weeks on one of the largest stations in Australia, and, this being a phase of Australian life which I had not experienced, I accepted with alacrity.

Starting from Sydney, I travelled by train for one and a half days out into the far north-western district of New South Wales, and then, alighting at a small siding where there was not even a house to be seen, was driven in a large car for three and a half hours over the roughest of bush tracks to the home of my host.

I had, not unnaturally, expected to find

that living conditions would be somewhat primitive in a place so cut off from civilization, but it would be no exaggeration to say that I had not seen a more complete and up-to-date home in the whole of Sydney. The house was supplied with its own electric current, even the kitchen was fitted with an electric stove; there was a long-distance telephone, a combined radio receiver and gramophone, a billiard table and every other luxury imaginable. Outside, built into the front garden, was a small swimming-pool, and in a field nearby was an aeroplane hangar





Geoffrey Morey

*Stock farming in Australia requires a large capital investment, for the isolated 'stations', amidst the huge grazing areas roamed by the stock, must be furnished with every need of an independent community*

which contained a 'Moth'. Last, but not least, was a self-contained deep drainage system for the house and all the out-buildings.

One of the most interesting of the out-buildings was the station store. It contained at least six months' provisions for the fifty-four people employed or living on the property. It would be almost as easy to describe what this store did not contain as to make an inventory of its contents. Flour, vegetables, all kinds of tinned foods, spare sets of harness, saddles, stock-whips, tobacco in great quantity and variety—everything that a stockman could possibly desire was there. One room was devoted to the library, where there were no less than three thousand volumes, ranging from the Bible and standard works to the latest 'best-sellers'. In another room was a veritable armoury, complete with rifles, shot-guns and pistols, and enough ammunition for a small army. The station

had its own cricket club and everyone played tennis on the three red earthen courts at the back of the house; even a rough nine-hole golf course had been made in one of the paddocks, so that there was a corner of the store set aside as a miniature sports dépôt.

On the front verandah of the house I found a large stand-telescope through which it was possible to see the country for miles around. Through it I could distinguish rabbits running about the hill-side in the far distance, and it was interesting to notice that the land on the other side of the boundary fence was quite brown and drab where the grass had been eaten by them, whereas on the near side all was green and bright. It was explained that the rabbits did an enormous amount of damage by eating up the grass needed for the sheep, damage which was estimated at thousands of pounds yearly, and that on every big station it was



## ON AN AUSTRALIAN SHEEP AND CATTLE STATION

necessary to surround the property with rabbit-proof wire, buried two feet in the ground. It is usually considered necessary also to employ boundary riders whose only duty is to keep the fences in repair and to destroy any rabbits that may manage to get through.

### BOUNDARY RIDERS

On this station there were eleven boundary riders, each of whom was provided with his own hut, two horses and a pack of dogs. These huts were, on an average, about sixty miles from the homestead and separated from one another by some eighty miles, thus leaving very large areas to be patrolled. Each man was required to make a complete report by telephone every evening, regarding the state of stock, feed and water in the paddocks adjoining his hut, to the overseer at the homestead, who is respon-

sible for the organization of work and the giving of daily orders to the station-hands. Many of the boundary riders have seen 'better days', and probably have drunk to thank for their isolation; others are elderly and experienced stockmen who prefer the independence of their lonely life to the routine of a job at the homestead. Each one comes in to the homestead to collect stores, and incidentally to spend all his money, about once every three or four weeks, and then rides once more, leading his pack-horse behind him, into the bush.

I was given a pony for my own use and, being very enthusiastic about shooting of any kind, used to ride every evening at sunset to the nearest boundary, which was only a few miles away. There with a .22 rifle I would sit and pot at the rabbits, usually managing to bag thirty or forty before the light became too dim. The more I could shoot, the better pleased the



*Geoffrey Morey*

*Boundary riders are important members of the staff where paddocks range from 5000 to 35,000 acres. Their duty is to patrol the fences and report every evening to the station by telephone*



*By courtesy of the Australian*

*Horse and dog are both indispensable to the Australian stockman*

## ON AN AUSTRALIAN SHEEP AND CATTLE STATION

station manager would be, for despite wire fences and boundary riders they were still getting through in sufficient numbers to cause hundreds of pounds' worth of damage.

On a big station every stockman has four or five horses allotted to him and it is his duty to see that they are maintained in good condition. They are his as long as he is on the station, and if the overseer should order changes to be made, except by special arrangement with the temporary owners, serious trouble is likely to result. Practically all the station work is done on horseback, for although a large flock of sheep may be driven through a gate in half an hour they may be scattered far and wide a few hours later and the paddocks range from 5000 to 35,000 acres

in area. The next time the sheep are wanted it may be for the purpose of lamb-marking, or, owing to the condition of the pasture, for transfer to another paddock, or for shearing. It may take six stockmen a day or a week to effect a clean 'muster' of a 10,000-acre paddock.

### MUSTERING

The paddocks are dealt with in routine, therefore it must be arranged that lambing and the subsequent lamb-marking shall take place at definite periods. The method of mustering is for the stockmen to ride out from the centre of the paddock in radiating lines but at such a distance from one another that they can keep in touch by shouting or by the barking of their dogs if scrub should hide their view. And it



*By courtesy of the Australian National Travel Association*

*The stockman's task consists in driving flocks to fresh pastures or in mustering them for lamb-marking or shearing. To muster a 10,000-acre paddock may take six men a whole week*





*By courtesy of the Australian National Travel Association*

*John MacArthur, who began importing merino sheep in 1796, laid the foundation of Australia's prosperity. The Australian merino's wrinkled skin enables it to carry an astonishing amount of wool*

may be stated here that any dog which will bark is better than no dog at all. Towards nightfall the sheep are driven into the nearest yards, for in large paddocks it is necessary to have these yards erected at regular intervals.

There is always plenty of work to do on a sheep and cattle station, and as I had arrived just at the busiest time I found myself occupied from daylight till dark. On the first three days I was sent out with two other visitors and one of the stockmen to round up some sheep in the 'homestead paddock', which was one of the smallest on the property. We started from the house at 8 A.M., but on the first day, after being in the saddle for nearly seven hours, we returned without having seen any sign of sheep. The second day we rode in another direction and brought in about eight hundred, and on the third day drove back over two thousand.

To drive a large flock of sheep is comparatively easy, especially if there are one or two good sheep-dogs helping; for in a flock they will remain together and may be moved quietly in the required direction, but in twos and threes they are the most exasperating brutes. If there are five, they will go in five different directions, and when they are exhausted they will lie down. There is nothing so conducive to rage as to look down from one's sweating horse upon an old ewe which lies panting but otherwise inert. It generally happens, however, that a flock is soon amassed; the baa-ing attracts stragglers and when a hundred or two have been gathered together they are driven along the line of musterers to the centre. Without dogs, this work is extremely fatiguing and needs infinite patience. Just when all seems to be going well, one or two sheep will break away and run in the opposite direction,

## ON AN AUSTRALIAN SHEEP AND CATTLE STATION

and to prevent the rest of the mob following and to bring back the strays often requires several hours' hard work.

### IN THE YARDS

When all the sheep have been driven into the station yards, it is necessary to draft them into different pens, according to their age, sex and the quality of their wool. To the spectator, this seems to be quite an easy matter, but in reality it is most difficult. The drafter must control three gates with his hands and must make up his mind quickly about which yard the sheep must be driven into. He must judge sex by the ear on which the station mark was clipped during the lamb-marking, and must at the same time deflect those animals with inferior wool into the 'mutton yards', while the lambs must be separated from their mothers.

Lamb-marking is an unpleasant experience for the lambs. They are caught by hand and held up to a rail, on the other side of which stands the marker. Out of one ear is punched the station mark, and out of the other a sign which denotes age; then the tail must be cut off, for otherwise it would act as a repository for fat and would grow to an enormous size.

It is obvious that only a small proportion of the sheep on a large station can be worked from the homestead yards, for with many of the paddocks as far as fifty miles distant it would hardly be practicable to ride to work in the morning and return for dinner at night. Camps are therefore established at convenient centres from which to work, and the station hands may not see the homestead for many weeks on end.

This station owned about 80,000 sheep,



*Long, lustrous fibres, having uniformity, strength and a firm, wavy, springy, distinctive the best grades of wool. The retention of 'spring' is wool's most important feature as a textile material.*

## SKILL IN THE SHEARING-SHED



*Whilst 130 to 160 sheep per day is considered good shearing, a very expert shearer can deal with as many as 300 sheep and earn up to £6 for his day's work*



of which some 20,000 were rams. As the quality and quantity of the sheep's wool depends so much upon the knowledge and the skill with which the animals are interbred, some of these rams were extremely valuable; one in particular, a prize Merino, had cost £5000.

There is always great excitement when the shearing begins—in fact, it is the main event of the year. Groups of men, numbering fifty to a hundred, travel about the country and are engaged weeks in advance. They arrive amidst much noise and shouting, in old Ford cars or wagons, and are all housed together in a very large shed which is specially built for the purpose. These men are, of course, all experts at their work and each man is paid £2 for every hundred sheep shorn. Formerly this arrangement was found to be not very satisfactory because in the shearer's haste the sheep were often improperly shorn and cut; but this was corrected by making each man pay a fine for such carelessness. Shearing is work which requires very special skill, but once this has been acquired the job is a very profitable one, for a man may make as much as £4 a day, whereas a stockman gets only £4 a week.

As the sheep are brought in, the shearer steps forward, grasps one by the neck and throws it unceremoniously on the floor. After a few moments the struggling animal resigns itself to its fate and remains quiet. The electric clippers are run quickly up and down the body, so that the wool is cut in parallel strips, each about six inches wide. It is then removed in one piece and thrown over the classing table, where a specially trained 'classer' judges its grade and then casts it upon one of the many quickly growing piles of different quality wools. Meanwhile others are pressing the wool into bales preparatory to being sent to the city for purifying, grading and ultimate sale. Within two hours of being shorn, some of the wool is already on its journey to the market, and two months



*By courtesy of the Australian National Trust*

*Dipping protects the sheep against parasitic infection, to which shearing exposes them. They are prodded completely under the disinfecting fluid*



*By courtesy of the Australian National Travel Association*

*Flocks are periodically branded with the mark of the owner. Special branding preparations are now preferred to tar, which injures the wool*

later it is in the woollen mills of Yorkshire.

As each sheep struggles to its feet after the wool has been taken, it is driven into another yard, from which there is a continuous procession to the 'dipping trough'. This is a long, narrow and deep canal filled with strong disinfecting fluid. The unwilling sheep are made to enter by being pushed from behind and are then forcibly immersed several times by means of a long pole as they struggle to the other side, so that thorough disinfection by complete immersion is ensured.

This 'dipping' is a very necessary process, for after the sheep have been shorn they are very easily scratched or cut. When this occurs they are almost certain to be attacked by blowflies, which lay their eggs in the wounds. These eggs may be hatched in a few hours, or even minutes, by the intense heat of the midday sun, so that the wounds become a mass of crawling maggots. Many sheep are killed yearly by blowflies, which unfortunately inhabit every part of Australia, whether it be city, plain or bush.

When the dipping is over the sheep must be driven outwards again, for unless great care is taken the grass around the sheds for many miles will be eaten up. To prevent this the animals must be quickly moved away. It may thus be seen that a number of men must be continually employed in maintaining a constant supply and in keeping those already shorn on the move.

The shearers are a coarse and noisy crowd, but nevertheless very amusing. Their evenings are usually spent in singing and dancing to the accompaniment of accordion, mouth-organ and violin. On most stations there are very strict orders against the men possessing liquor of any sort, but this does not prevent the shearers bringing an ample supply with them. When it gives out, during a particularly hilarious gathering, they will drink methylated-spirits, and then there is nearly always serious trouble which finishes by someone getting hurt.

## ON AN AUSTRALIAN SHEEP AND CATTLE STATION

After the shearing is over, the men move off to the next station, which is often a couple of hundred miles distant, and then, when the season finishes, the band breaks up to seek casual labour until the next year.

### CATTLEMEN

Cattlemen have a much harder and more venturesome life than those who work among sheep. The work is much faster and a man needs to be a very expert horseman and to be well mounted, before he can attempt it. Great care and skill are required in preventing a 'break-away', which may eventually terminate in a stampede, whereby some of the animals may be killed or injured. Unfortunately dogs are not of much use. The mustering of cattle may be necessary for the sale of selected beasts, or for breeding. For the

former purpose, cattle are seldom driven to the yards. The herd is driven to a clear patch of country, where the stockmen 'cut out' any animal selected by the purchaser. This is very exciting work, and extremely tiring. If it is necessary to throw a bullock for branding, the stockman gallops after it and takes a grip of its tail close to the body. A single twist is sufficient to send the beast sprawling in the dust, and after two or three such crashes, it can be roped for any purpose.

It should not be imagined that the Australian stockman resembles in any way, the American cowboy so often seen in the cinemas. He carries no firearms and no lasso, only a very long stock-whip with which he can direct the leaders of the herd from his position near the rear. He is a wonderful rider and his horse is so trained



Geoffrey Morey

*In a country where distances are vast and population sparse, the bullock-wagons with their bales of wool may have to travel a hundred miles or more to the nearest railway*





*By courtesy of the Australian National Travel Association*

(Above) Hard, skilful riding is essential in mustering cattle. If the stockman does not get there first, a break-away from the big mob may develop into a stampede. Below: Single beasts 'cut out' for sale or separation according to ownership, are controlled by close pursuit and cracking whips

*By courtesy of the Australian National Travel Association*





*Geoffrey Morey*

(Above) Droughts, not uncommon in certain areas, may last for twelve months and wipe out small station owners. A well in Central Australia. (Below) No practicable method of branding cattle save with a hot iron has yet been devised. Calves are usually branded when about three months old

*By courtesy of the Australian National Travel Association*



that it carries out the work without the slightest effort on his part ; it is as though the horse and rider were one. The stock-whip, which varies from ten to twenty-five feet in length, is fastened to a short handle, and with it the stockmen can often perform the most amazing feats, such as cutting off the head of a snake, or flicking a cigarette out of the mouth of a companion standing some yards away.

It would, of course, be far too expensive to send cattle to the markets by train, and in many cases the stations are hundreds of miles from the nearest railway. Therefore large herds must be driven down to the city. This requires from five to twenty men, according to the size of the herd, and may take several weeks. The duration of the journey alone is one of the stock owner's great difficulties, for during this time there may be a big fluctuation in market prices, so that he may actually lose money on his transactions. It is necessary for the cattle to be driven along certain routes that have been recently reported by a forerunner as suitable, so that sufficient food and water may be found on the way.

It sometimes occurs, however, despite all precautions, that after two or three days' march the herd arrives at a waterhole which has already dried up. This means that they must press on with all speed, almost certainly leaving a number of cattle to die on the way, and by the time the next waterhole is reached the greatest skill is required to prevent the thirst-maddened animals from stampeding, thereby causing further loss of life and fouling of the water as they rush in. This difficulty is usually overcome by dividing the herd into small sections some distance before the water is reached and driving one lot down at a time.

#### WHERE THE BIG MAN WINS

Australia is a strange country. If a man has enough capital to control a big

sheep and cattle station he will, in all probability, make a considerable amount of money ; but, because the seasons are so uncertain, he must also be prepared to lose a considerable sum. Many farmers and small station-owners may be wiped out by a severe drought which lasts for twelve months or more. These droughts are, unfortunately, not so very uncommon and there is nothing that one can do to prevent sheep, horses and cattle dying, literally, by hundreds. I was told of one station owner in New South Wales who went out and shot all his horses rather than see them die from thirst ; had the drought lasted much longer, there would not have been enough water for the household. Even the rabbits, which normally are accustomed to live with little or no water, were dying by the thousand ; the opportunity was taken to kill them off during this period. In the course of three days, eight men armed only with sticks killed some eight thousand. Other wild animals too, such as kangaroos and even snakes, were coming right into the station yards in the hope of finding water.

By the eccentricity of Nature, a severe drought is often followed by an equally severe flood and those animals which have withstood months of suffering from thirst are often left to drown, unless they can be forcibly driven to take refuge in the higher areas.

One is apt to think that money is easily made 'on the land' in Australia ; provided one has capital enough to tide over bad periods this supposition is, to a certain extent, true. For the man who attempts to live on what he earns, however, it is heartbreaking and more often than not ends in failure.

To stay on a big station as I did, where everything runs on oiled wheels, is only seeing one side of the picture ; but it was certainly a side that made me wish I had decided to try my luck 'on the land'.



# Lumbering in the Ardennes

Notes and Photographs by Cyril Arapoff



*The great forest of the Ardennes extends across south-eastern Belgium from French soil on one side to German on the other. Deep in its heart groups of men are continuously at work, as the trees in different areas reach maturity. Some of these are local men, at home in the forest; others are brought in by concessionnaires to cut and handle a particular stand of timber. All are French-speaking Walloons; and all their wives complain of housekeeping in such difficult circumstances!*



*The bûcheron, to whom every forest path is familiar, clears the undergrowth in preparation for the felling of big timber and is often a charcoal-burner (and poacher) when not thus employed*



*The abatteurs, paid a given sum for each tree felled, work entirely with axes—never with saws. They are so skilled that they can cut a big beech in four hours and make it fall just where they wish without ropes*

*To the felled trees come the charretiers, paid by the job under contract to the concessionnaire, and with their stalwart horses haul them down to the timber-wagons on the nearest track*



*The charretiers use their own horses and timber-wagons; the latter provided with large pneumatic tires for work on the rough ground. No trucks are used; each horse answers to the master's voice.*





*At steep places the power of the team is increased by indirect hauling on a cable run from the wagon to a pulley at the top of the slope*

*Half-way to the sawmill the charretiers, ever careful of the horses in which their small capital is invested, halt them for water and rest near one of the forest streams*

*The bucket left at the halting-place is filled from a slippery pole-bridge that may be the only means of crossing the swift stream for many miles*



*Exhausted with the strain of hauling on rough, muddy tracks, the team with its freight of timber at last reaches the sawmill established by the concessionnaire at the nearest accessible point*





*At the sawmill the timber is cut into sections by portable automatic saws and then transferred to the big circular saws. These convert it into marketable shape—for example, railway sleepers if, as is frequently the case in the Ardennes, it consists of beechwood*



# Across South America

by ALEC LACY

*Messages lately received from Buenos Aires, regarding the forthcoming purchase and reconstruction of the Transandine Railway by the Argentine Government, lend topical interest to the following account of one of the most remarkable railway journeys in the world. £350,000, it is reported, are to be provided for repairing the section of the line destroyed by flood in 1934.*

RAUCOUS-VOICED newspaper boys droned their way through a dense throng in the Retiro Station of the Argentine capital as we waited for the 'International' express. Noise does not trouble the people of Buenos Aires. I said something of this to a friend on the platform.

"Yes," he replied, "I took some boots back the other day because they squeaked. The man looked at me reproachfully: 'But, señor,' he answered, 'my other customers return their boots if they do not squeak and tell me to put the squeak in again. They say they feel lonely without it!'"

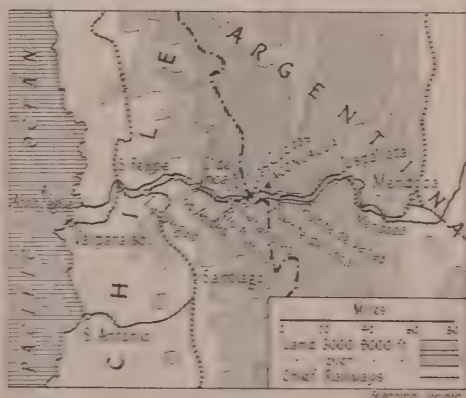
Bells rang, passengers clambered in, the train drew out of the station, and the tumult died away.

Buenos Aires is the largest city of the Southern Hemisphere, and it is half-an-hour before the train leaves the last suburb behind. The Buenos Aires Pacific Railway (somewhat misnamed, for it ends on the western side of the Andes at Mendoza, while from there onward the line is called the Transandine Railway), is one of the lines forming an intricate network con-

verging on the River Plate which owe their existence to British enterprise.

Before starting on its long westward journey, the train passes the famous polo ground of the English Club at Hurlingham. In the Argentine, polo is a national sport that compares favourably with football in Britain. In the latter years of the last century, thoroughbred sires were imported from England and bred to the native Creole pony that roamed the pampa. The result was a fine well-made animal with great heart and endurance whose descendants are bred and trained on many estancias at the present day.

In its journey from the Atlantic to the Andes, the train has to traverse a distance of 660 miles across a plain as flat as a billiard table, where the estanciero counts his land by the league instead of the acre. Nothing in orthodox art represents life out on these open spaces so vividly as the poster caricatures of Molina Campos for the advertisement of a rope-soled shoe. He is the artist of the gaucho, that illiterate and half-savage cowboy of the 'camp', as the vast, open plains are known to the





W. Mittelholzer

(Above) Buenos Aires, with 2,200,000 inhabitants, is a city of sprouting skyscrapers little reminiscent of Spanish Colonial days. From these, however, dates the rectangular 'American' layout of its streets, prescribed by the Spanish authorities. (Below) Polo at the Argentine Hurlingham

J. Munro





*Victor León*

*Victor León*

*Maté yerba, sucked through a tube from a hollow gourd, is the national drink of Argentina. As a preventative of scurvy it is very useful to the gauchos with their meat diet*



*These half-Indian cowboys of the Argentine plains are superb horsemen; a mere sheepskin laid over the horse's back is all that they need, in such flat country, for a saddle*





*Molina Campos, in his advertisements drawn for Alpargatas, rope-soled shoes made at Buenos Aires, has depicted every phase of the gaucho's life. Here he is seen chasing ostriches with the bolas*

English in the Argentine, from the Spanish *el campo*, the country. A mixture of Indian and Spaniard in felt hat, wide bombacha trousers, huge spurs and silver-studded belt—Molina Campos shows him chasing ostriches, shearing sheep, playing the guitar and rounding up cattle.

Forty miles west of the Capital, we passed Luján, dominated by a church that houses the Virgen de Luján. Legend has it that in the time of the Spanish dominion, some monks set out to transport a statue of the Virgin from Buenos Aires to Peru. Nothing could induce the oxen to draw its cart beyond Luján and there the statue remained. In course of time it acquired a reputation for effecting supernatural cures, and the site has become a centre of pilgrimage for the devout.

Beyond Luján, herds of cattle and horses grazed contentedly on the succulent grass. Their numbers are beyond counting to-day, but both animals were strangers to

the Pampa Indians when they were first brought over by the Spaniards in the sixteenth century. They multiplied so prodigiously that their value was considered of no account. The gaucho would slaughter a cow to get enough meat for one meal; and it is even recorded that, where there were no trees, he would kill one so as to tether his horse to the dead animal's horns!

For two centuries, thousands of these cattle were slain for their hides alone, which were used not only on the pampa for boots, saddles and tents, but also exported in large quantities to Europe. Spain had forbidden her colonies of the New World to trade with other countries than herself, so that a system of smuggling hides out of the country became a recognized practice connived at by the Governors of Buenos Aires. By 1830, however, a new industry had sprung up. The carcases were salted and dried in the sun; and this charque or

jerked beef was exported for the consumption of slaves in the West Indies and Brazil. It is still consumed in the country, but as an export the industry is dying, owing to the increasing use of frozen meat.

The introduction of meat-freezing plants completely revolutionized life in the Argentine. Prize bulls were imported from England, stock was improved, and wind-mills—now such a familiar feature of the landscape—were erected to pump water for the cattle during droughts. Posts or *quebracho*, an almost imperishable wood from the Chaco, were used for the interminable lines of wire-fencing to prevent the high-bred stock from mixing with the wild cattle. As a result of these measures, immense fortunes were made by the owners of the great *estancias*.

The train rumbled on. Near Mercedes we were fortunate enough to see some horsemen chasing ostriches with the *colas*. A weapon of Indian origin, it consists of three weights connected together by leather thongs. The riders separate a bird from the flock, ride after it at full tilt, whirl the *colas* overhead and let fly. The ostrich comes to the ground with its neck and legs entangled in the coils of leather.

The plain became more desolate again. There was hardly a tree to be seen. When the Spaniards arrived in the country, the spreading *ombú*, with its swollen trunk, was the only tree they found. Locusts had eaten all the others. Eucalyptus trees have since been introduced, but the only tree safe from the really hungry locust is the paradise tree. It has a particularly bitter sap, and is grown to give some shade round the isolated *estancia* houses. This absence of trees accounts, no doubt, for the apparent scarcity of bird life out on the camp.

Occasionally we passed little groups of people in the shade of a country store, sucking *maté yerba* through a tube from a hollow gourd. Vegetables are little grown in the Argentine, and the country

labourer lives almost entirely on meat. *Maté yerba*, a tea made from a shrub indigenous to Paraguay, has become the national drink, and takes the place of vegetables as an anti-scorbutic.

The straight, wide roads across the stoneless pampa are deep in dust during the dry weather and thick with mud when it rains. In the wet season, cars have to have chains round the tyres, while grain and hides are brought to the railroad in carts fitted with immense ten-foot wheels to prevent them from sinking into the mud. Houses are built of adobe or crude earth bricks. They are unimposing dwellings fitted with a parapet: a survival of the days of Indian raids, when settlers climbed on to the roofs to shoot the savages from behind its shelter.

At La Picasa, the fertile country ceased and gave place to immense expanses of marsh remarkable for the millions of pink flamingoes, white swans, herons, cranes, ibis and duck which peopled the waters as far as the eye could see. An hour or so later, as night fell, a heavy thunderstorm burst over the plains.

When I peered out of my sleeping-cabin early next morning, the storm had yielded to sunshine. The flat country was coming to an end and small streams were running in beds of rounded stones. Shortly after six o'clock we reached the threshold of the Andes at Mendoza.

Centre of a busy wine industry and surrounded by vineyards, Mendoza is delightfully picturesque after the uninspiring cities of the Argentine plain. The streets are shaded by rows of plane trees, and as the town lies at a considerable altitude, the air is pleasantly cool. Originally founded in 1561 by García de Mendoza, then Governor of Chile, the entire town was destroyed by an earthquake some seventy years ago, but the memory of that event is almost forgotten, and today it has a flourishing population of 70,000 inhabitants. We drove out to the public park, which has the distinction

of being the largest in South America. In the centre rises a rocky hill, first outpost of the Andes, with a road winding to the top, where there is a tremendous monument of bronze and granite called 'The Armies of the Andes'. It commemorates the passage of the Andes by the troops of

San Martín early in the last century to liberate Chile from Spanish rule; an enterprise worthy to rank among the great feats of military history.

As the sun sank behind the mountains in a blaze of crimson and purple, one of the great Douglas liners of the Pan-American Airways swept over the snow-clad summits after crossing from Chile, and swooped like a condor onto the plain below. The trip by air only occupies 40 minutes from Santiago to Mendoza as compared with 18½ hours by land. The Panair Company maintains a meteorological station at an altitude of 14,000 feet in constant touch with points on both sides of the mountains. Flying over the Andes has changed, since this station has been installed, from a hazardous venture to one of the safest flights in the world. It has also made lobsters in Chile an expensive luxury. They are brought from the island of Juan Fernandez to Valparaiso where they used to be obtained quite cheaply, but the Panair planes now carry them on to the restaurants of Buenos Aires, and those that remain can only be bought at prohibitive prices.

I was up shortly after five the following morning. A convoy of powerful cars was drawn up beside the railway station. In the early part of 1934 an avalanche high up in the Andes dammed the upper reaches of the River Mendoza. A lake formed, and the weight of water gradually increased until the wall of ice burst with a roar and released an immense mass of water in the middle of the night. Before there was time to convey any warning of the impending catastrophe, the flood had rushed down the valley carrying all before it. It swept away bridges and roads, wrecked the dam of an electric power station, demolished houses, and obliterated 120 miles of the Transandine Railway. At the time of my visit it seemed unlikely, owing to the great cost, that the railway would ever be renewed over this gap in the line; and a motor-car service under



J. Munro

*The great monument at Mendoza commemorating the passage of the Andes by the troops of San Martín to liberate Chile from Spanish rule*



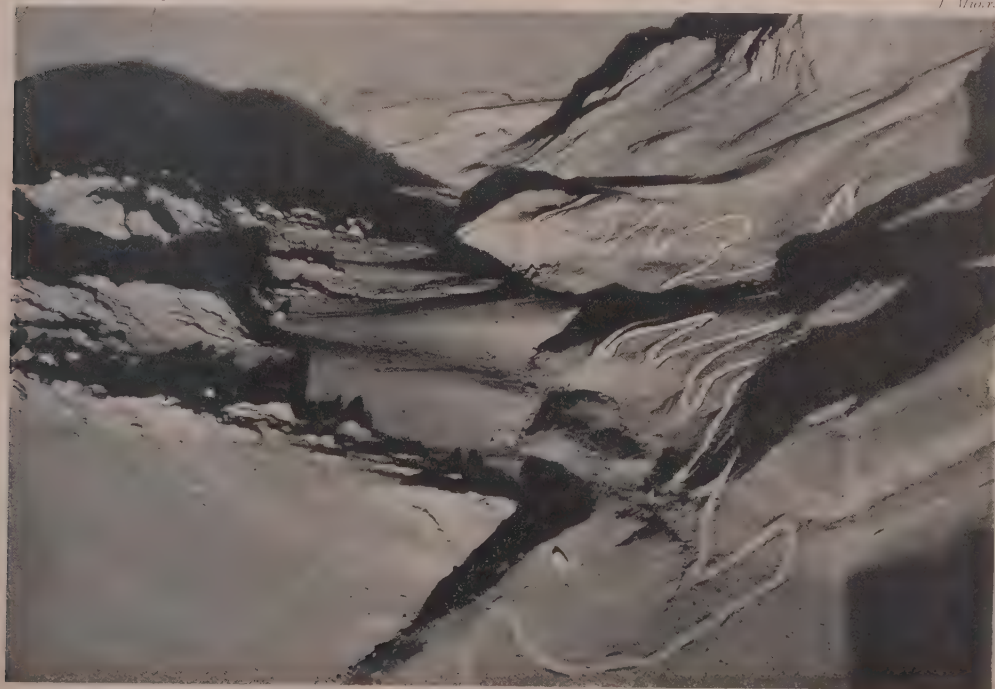
*The Transandine Railway, built by British engineers, took over 20 years to complete. In 1934 a long stretch of the line was destroyed by flood, but is now to be reconstructed*

*While the international road climbs in endless zigzags over the 12,500-ft. pass dividing Argentina from Chile, this is avoided by the railway tunnel from Las Cuevas to Caracoles, opened in 1910*



*From American Airways*

*J. MACK*





Victor León

*Puente del Inca, a health resort with hot springs that are efficacious in rheumatic complaints, is also the best point of departure for excursions in the Andine valleys or for the ascent of Aconcagua (above), the highest mountain in the Western Hemisphere*

Victor León



English management had taken its place. The Chamber of Deputies in Buenos Aires, however, has just passed a Bill for its rebuilding and purchase by the State. This decision is in accordance with the Argentine Government's policy of gradually purchasing all the privately owned railways in the country—a policy that will eventually mean the end of a long history of British enterprise in that great area of the western world.

The first part of our journey was along a straight road sloping gently up towards the foothills through rough brown country with broom and scrub and aromatic plants growing between the rocks. Clumps of cactus with immense flowers like white lilies grew here and there. At the mountains we left summer below and the car entered a gloomy gorge that twisted sharply from side to side; while the road merged into the dry and stony bed of a mountain torrent.

Steep rocks rose on either hand, dotted thickly with a large cactus like a hairy caterpillar standing on end. For an hour or so we passed through a belt of dense fog, and by the time we had mounted above it, the country had become a stark chaos of boulders with here and there the remains of abandoned gold and silver mines, once worked by the Incas and early Spanish invaders. At one point we passed the remains of fossilized tree trunks referred to by Darwin in his immortal Journal.

By a series of preposterous zigzags the road wound about among rugged and barren hills of rich and varied colouring. Purple slopes streaked with yellow or red varied by sunlight and shadow made a riot of brilliant tints. Suddenly the car rounded the corner of a huge buttress at Paramilla de Uspallata, and there before us lay an enormous valley, and beyond it the vast range of the snow-capped Andes with fleecy clouds throwing their shadows on the mountain sides. We were at the southern end of a continuous depression

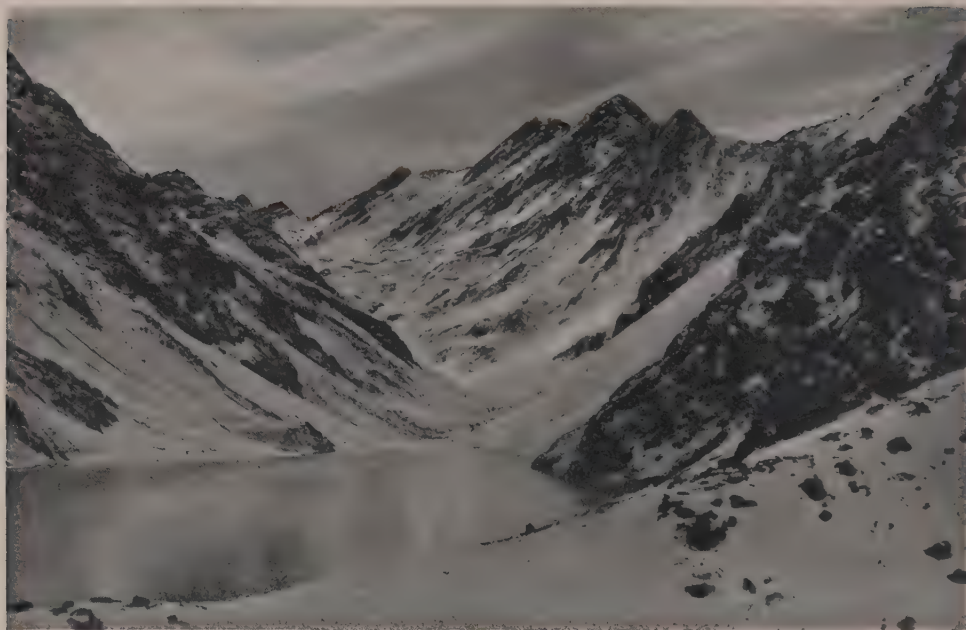
between parallel chains which runs north for a thousand miles to the frontiers of Peru. In the days of the Inca Empire, it was the main route of continental traffic whereby Cuzco, the capital of the Empire, was kept in touch with the southern provinces. We stopped for coffee and sandwiches at a small inn lying in the centre of the valley. It was an oasis of green fields, poplars and willows amid the surrounding barrenness.

Then on again by road, skirting the edge of steep precipices overhanging the River Mendoza which rushed along in the valley below. At one point we stopped at a camp of tents where the road-menders had their headquarters. We were greeted by an immensely fat and cheerful Italian foreman in broad-brimmed hat, baggy



*On the pass between Argentina and Chile stands the statue of Christ erected in 1904 by Argentine workers as a token of perpetual peace*





Chilean Tourist Bureau

*From Caracoles at 10,400 ft., the first part of the descent is extremely steep, with towering snow-clad peaks on either side. These are especially impressive near the Lago del Inca*

linen trousers and tall riding-boots. His assistant was a Swiss who told me that he had been in that desolate spot for eight months and longed to return to civilization. Here and there were the remains of railway lines, twisted and broken by the flood, and we passed a cave into which a tramp had climbed, seeking refuge from the rising waters. In the morning he had found a precipice of forty feet below him, and was a prisoner for six days till he was rescued by some passers-by with a ladder of rails and sleepers.

At half-past twelve, we reached the end of our car journey, Punta de Vacas, a little station 7850 feet up at the junction of three valleys. Here we changed into a small train. The line is so steep that the engine has to crawl upwards with the help of a rack. At Puente del Inca, 8900 feet up, the train stopped long enough for us to get out and look at the curious natural

bridge of rock spanning a hot stream. From here we got a glimpse of Aconcagua, highest summit of the Western Hemisphere, austere and remote in its snowy purity.

The snow lay about in patches, and the line ran through tunnels made of thick baulks of timber and sheet iron to keep the rails clear during the winter. Some of the passengers were overcome with a feeling of faintness, a sensation which increased as the train mounted to Las Cuevas, a station near the entrance to the international tunnel bored through the mountains at a height of 10,450 feet. It was a grim spot, with no vegetation beyond a few patches of colourless grass. The workmen on the line were Mongolian-featured Indians in thick woollen caps and stockings. The tunnel passes underneath the famous statue of Christ erected on the frontier, with this inscription:



*Anthony Stobart*

*The high valleys of the Aconcagua River and its tributaries are more fertile than those on the Argentine side of the Andes, owing to the heavier rainfall*

*Many kinds of fruit—especially the grape—are cultivated by the Huasos of these Chilean valleys, whose high-peaked saddles (mark of the mountain horseman) contrast with those of the Argentine Gauchos (p. 63)*







Victor León

*Valparaíso, terminus of the transcontinental journey. From the Andean divide it is barely 80 miles to Valparaíso as the crow flies, compared with 700 miles to Buenos Aires*

Sooner shall these mountains crumble into dust than the people of Argentine and Chile break the peace which at the feet of Christ the Redeemer they have sworn to maintain.

From Caracoles on the Chilean side the gradient descends very steeply till it reaches the Lago del Inca, in a setting of barren mountain slopes, reflecting the glaciers and snowy peaks above. The train wound downwards in serpentine curves close to the first swirling waters of the River Aconcagua. Waterfalls flung themselves over chasms above to shiver on the rocks below as they plunged to join the foaming torrent. Gradually the valley widened, bare rock yielded to verdure, and we came to rest at the little station of Rio Blanco. Below this the line entered a cultivated valley, flowers mingled with organ cactus, poplar trees lined the roads where riders trotted along in wide sombreros with brightly coloured ponchos

thrown over their shoulders. At seven o'clock in the evening we reached Los Andes, the end of the Transandine line, and changed into the broad-gauge State Railway.

The nitrate crisis had struck Chile a fearful financial blow, and thousands of labourers from the nitrate factories had been rendered destitute. Pathetic children half covered in rags begged for scraps at the side of the train. Poverty, dirt and undernourishment had caused an outbreak of typhus, and warning posters displaying an immense louse decorated the railway stations.

Another change at Las Vegas, for the main line ran on to Santiago, the capital, and we steamed on into the night. Then myriads of lights flashed out of the darkness and cast their reflections on the waters of the Pacific Ocean.

We had reached Valparaíso.



# PHOTOGRAPHIC NOTES

Edited by F. S. Smythe

## 20. CINÉ-PHOTOGRAPHY (7)

At the opening of this year's exhibition of the Royal Photographic Society, a speaker complained that the important part played by photography in our civilisation today did not appear to be fully appreciated by the general public.

Photography is so widely used for purposes seemingly remote from the amateur's album or reels of ciné-snaps, that many photographers are quite unaware of their hobby's application to science, industry, medicine, criminology and art—to say nothing of printing, reproduction and advertising.

The amateur may do well to consider for a moment, some of the non-picture-making uses to which his camera may be put. As an example, we may mention some interesting research which was done recently on the speed of birds in flight, this speed being measured by means of slow motion ciné-cameras recording the movements of the birds.

Now a slow motion film is made, not by running the film slowly through the camera, but by running it through faster than usual. A normal 16 mm. ciné-film runs at the rate of 16 frames per second. If this number of frames is doubled to 32 per second and the processed film subsequently run through a projector at the normal speed, any single movement of the subject which may have taken 1 second (or 32 frames during shooting) is slowed to 2 seconds with a projector running at 16 f.p.s.

Some of the better makes of amateur ciné-cameras are now fitted with a 'slow motion' adjustment to the film speed, so that pictures can be taken at 16, 32 or even 64 frames per second. By making use of this adjustment the amateur can actually carry out researches into the speeds of birds, running animals and movements of athletes and arrive at figures correct to  $\frac{1}{32}$ nd or  $\frac{1}{64}$ th as the case may be.

The illustration shows how the data for a calculation of the speed of a high jumper after he leaves the ground can be collected by means of a ciné-camera running at 64 frames per second.

The point where the jumper leaves the ground is noted from the foot impression and the distance to the foot of the bar is measured. The height of the bar, of course, is known, so that by a simple application of

Pythagoras, the length of the hypotenuse along which the jumper travels in his journey over the bar can be arrived at. A minute examination of the film will show the number

$$x^2 = y^2 + z^2$$

$$x = \sqrt{y^2 + z^2} \text{ FEET}$$

THIS DISTANCE IN  $W$  FRAMES AT 64 F/SEC,  
OR IN  $\frac{W}{64}$  SEC.

$$\therefore \text{SPEED} = \sqrt{y^2 + z^2} \div \frac{W}{64}$$

$$= \frac{64 \sqrt{y^2 + z^2}}{W} \text{ FEET PER SEC.}$$

*With the aid of an amateur ciné-camera running at 64 frames per second, or at 'slow motion', the actual speed of the high jumper can be calculated. The speed of a fox, hare or other wild animal might also make an interesting subject for research of this kind.*

of frames which this portion of his journey takes, and since each frame represents  $\frac{1}{64}$ th of a second, the total time can also be estimated. With the distance and the time as data, the calculation of the speed in feet per second or miles per hour is purely a matter of elementary mathematics.

A further interesting experiment which the amateur ciné photographer can carry out for himself is the reverse of slow motion—known as time-lag photography.

A picture is made of a growing plant over a period of, say, three weeks, each frame being exposed at regular intervals of an hour. When the film is run through the projector, the plant is seen to grow and bloom within a few minutes, and an interesting analysis of the actual movements of leaves and petals can be carried out.

This time-lag technique can be applied to the metamorphosis of insects and other biological changes.

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